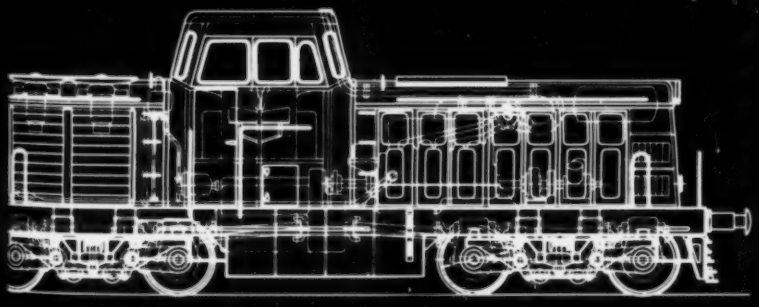
# *Argentina: Recovery Begins*

**Reprise économique argentine**
**Argentiniens Erholung beginnt**
**La Argentina sanea los FC**

# INTERNATIONAL Railway Journal

November, 1961



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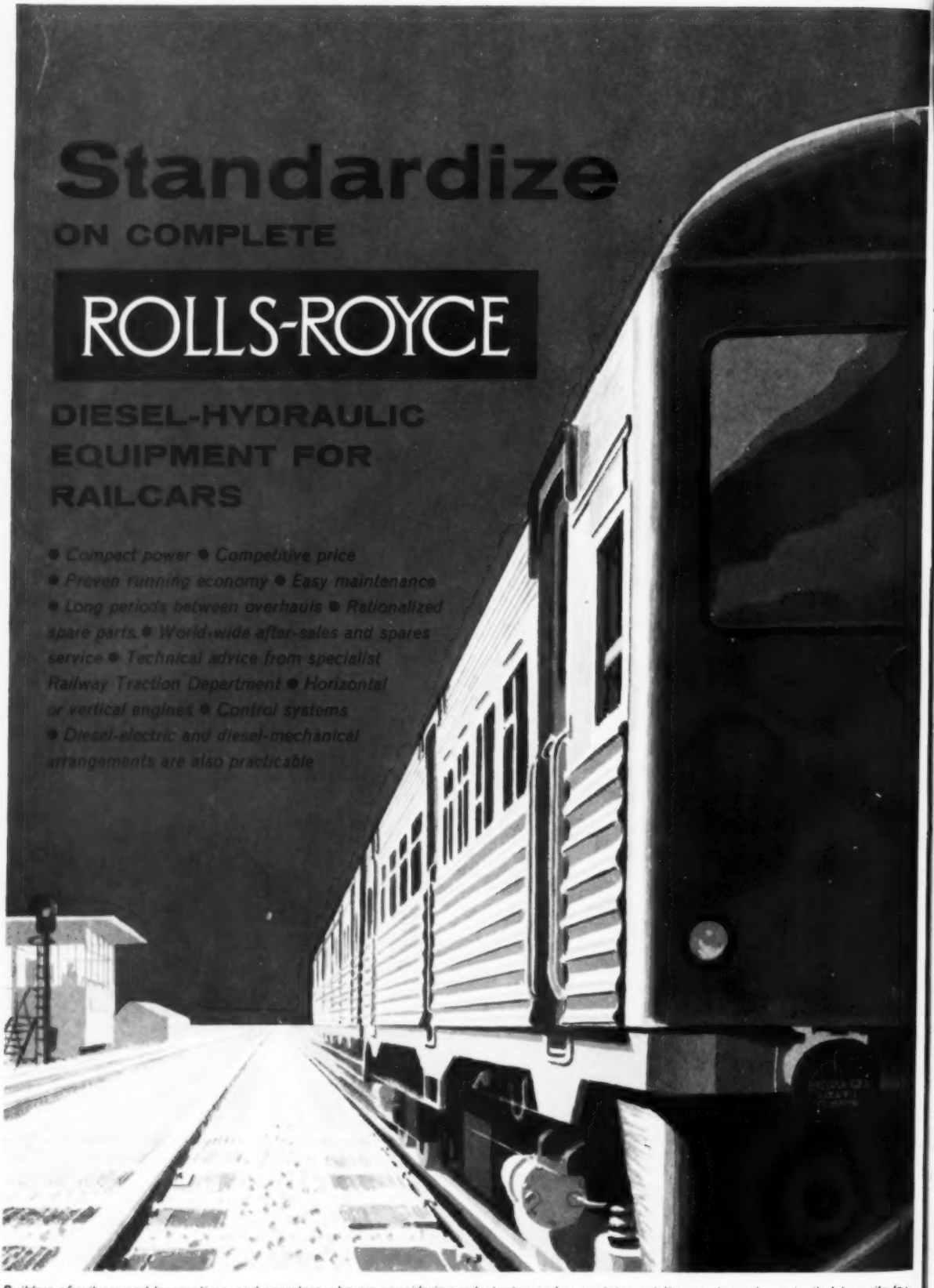

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**Disc-webbed, roller bearing crankshaft and tunnel housing**

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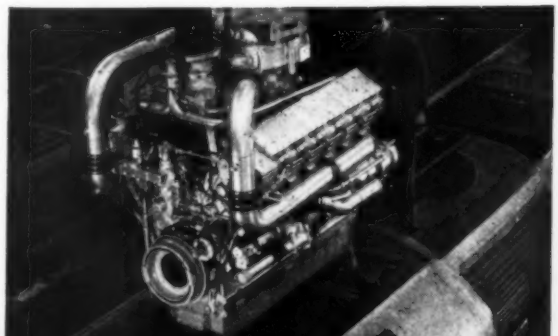

*Maybach diesel engine being installed in D800 Class at Swindon.*

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November 1961

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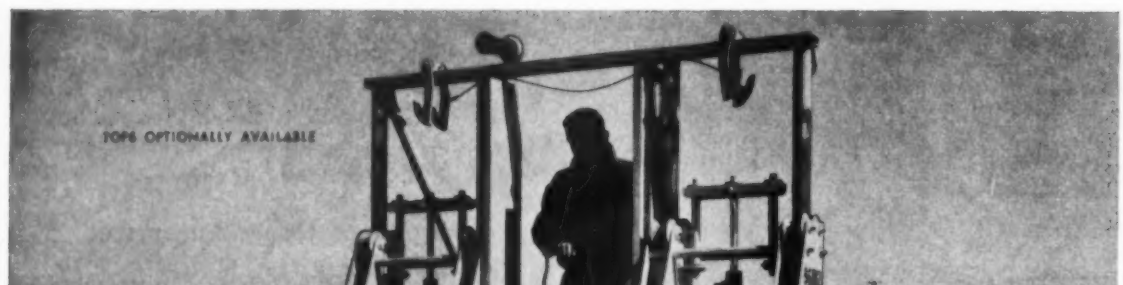
# 2

# NEW JACKSON UTILITY TAMPER

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**MODEL 104:** Has gasoline engine and 4 TM1161 Vibratory Tamping Units. This is an excellent machine for work in all but the most difficult going . . . an ideal all-around tamper for yard and branch line spot tamping, surfacing work, and emergency tamping. OK, too, for general use in small or soft ballasts. Excellent for new construction and high lift ballast insertions anywhere.

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**SIMPLIFIED FOR EASY, ECONOMICAL MAINTENANCE:** Both of these relatively low-priced models are simplified in design, power plant and controls for easy, economical operation and maintenance. Tops optionally available. You'll find the one best suited to your requirements an exceedingly good investment. Detailed information is yours for the asking.

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## RÉSUMÉ

2 NOUVELLES BOURREUSES JACKSON – Economiques, très efficaces.

MODELE 260: Moteur Diesel, génératrice à grande capacité et 4 bourreuses vibratoires du type Jackson le plus puissant. La machine a une force de pénétration maximum et manipule facilement du gros ballast. Excellente pour tous travaux d'entretien dans n'importe quelle sorte ou condition de ballast. Rapide pour des nouvelles constructions ou des hautes élévations.

MODELE 104: Moteur à essence et 4 bourreuses vibratoires. Excellent pour tous travaux, sauf les très grosses besognes. Idéal pour le bourrage de petites surfaces et les travaux de nivellement et pour usage général dans des ballasts moux ou à couche mince. Les vérins de levage peuvent être commandés séparément. Modèle simplifié d'entretien facile et économique.

BOURRAGE ENTRECROISE: Seules les bourreuses Jackson sont efficaces dans le bourrage entrecroisé. Leur action vibratoire unique consolide uniformément une assiette parfaite de grandes proportions pour les traverses sous la base des rails.

## RESUMEE

2 NEUE JACKSON GLEISSTOPFER – Wirtschaftlich, sehr wirksam.

MODELL 260: Dieselmotor, Stromerzeuger mit hoher Leistungsfähigkeit, mit 4 vibrierenden Gleisstopfmaschinen vom kräftigsten Jackson Typ. Die Maschine besitzt eine maximale Durchdringungsfähigkeit und bearbeitet bequem grosse Bettungsmengen. Ausgezeichnet für alle Unterhaltungsarbeiten in jeder Sorte oder Beschaffenheit der Bettung. Arbeitet schnell für Neuanlagen oder mit hohem Aufzug.

MODELL 104: Benzinmotor und 4 vibrierende Gleisstopfmaschinen. Ausgezeichnet für alle, ausser den schwierigsten, Arbeiten. Ideal zum Stopfen kleiner Flächen und zum Einebnen sowie zu allgemeiner Verwendung in dünnen und weichen Bettungen. Schraubenwinden werden auf Wunsch mitgeliefert. Eine vereinfachte Ausführung für leichte und wirtschaftliche Unterhaltung.

KREUZSTOPFEN: Nur Jackson Gleisstopfer sind für das Kreuzstopfen leistungsfähig. Dank ihrer einzigartigen vibrierenden Leistung konsolidieren sie einheitlich eine perfekte Bettungssohle von grossen Ausmassen unter der Schienenauflage.

## RESUMEN

Dos nuevas apisonadoras JACKSON – Económicas y de alta eficiencia. El Modelo 260 tiene motor diesel, generador de gran capacidad y 4 apisonadoras vibratorias Jackson del tipo más potente. Esta máquina tiene una fuerza de penetración máxima y trabaja fácilmente con balasto grande. Excelente para todo trabajo de mantenimiento en cualquier clase de balasto. De acción rápida para obras nuevas o alzamientos grandes.

El Modelo 104 tiene motor de gasolina y 4 apisonadoras vibratorias. Ideal para casi cualquier trabajo, como apisonamientos localizados, trabajos de nivelación y uso general en balastos suaves o pequeños. Gatos elevadores opcionales. De mantenimiento sencillo y económico.

APISONADO TRANSVERSAL: Sólo las apisonadoras Jackson resultan eficientes para el apisonado transversal. Gracias a su excepcional efecto vibratorio el lecho para la traviesa queda perfectamente consolidado, con gran uniformidad en toda el área bajo la base del riel.

**JACKSON VIBRATORS Inc.**

# World Market

▶ *Argentina*—The government has placed orders for 145 diesel-electric locomotives with two US manufacturers—General Motors Corp. and General Electric Co. General Motors is to supply within the next eight months 15 800/850 hp GA-8 locomotives and 60 1310/1425 hp G12 units. The order placed with General Electric is for 70 U-13C 1300/1420-hp units. Delivery of these units is to begin within five months and should be completed in one year. (See "Argentina: The Long Road Back," page 34.)

The Argentine government has also reportedly approved a contract for the purchase of 200 multiple-unit electric coaches from Japan. Cost of the new passenger cars is approximately $18,000,000 (US).

▶ *Australia*—Queensland Government Railways asked for bids, due 8 Nov., for construction of 885 km of roadways, exclusive of track laying. The work is designated as Contract No. 8, and must be performed at 36 different locations over a distance of 386 km. Major items include 1,500,000 cu yd of common and rock excavation; 1,000,000 cu yd of embankment construction, including culverts and related work; and 128 km of fencing.

▶ *Britain*—The British Transport Commission has placed orders totaling £2½ million for main-line diesel-electric locomotives and multiple-unit train equipment with three English manufacturers. The orders go to The English Electric Co. Ltd., Brush Electrical Engineering Co. Ltd., and British United Traction Ltd. English Electric is to build 17 type 3 1750-hp locomotives. The order placed with Brush is for 10 type 2 1365-hp locomotives. Both the English Electric and the Brush locomotives will be allocated to BR's North Eastern Region. The BUT order is for 20 sets of equipment for powered cars and 20 sets of control equipment for non-powered trailer cars. The equipment will be used for 10 four-car multiple-unit trains which are to be built at Swindon for the Western Region for operation in inter-city service between Swansea and Birmingham. Each powered car will have two 230-hp underfloor-mounted engines providing a four-car set with two powered cars with a total output of 920 hp.

BTC has also ordered a 7000-ton passenger ship for BR's overnight Harwich-Hook of Holland service. The ship, which is being constructed by Alexander Stephen & Sons Ltd., will be the largest ever built for BR's cross-channel service. The vessel, which will accommodate 750 passengers, is expected to be in service by mid-1963.

▶ *Burma*—The Railway Board invited bids, due 3 Nov., on one meter-gauge diesel locomotive.

▶ *Greece*—Greek State Railways has ordered seven diesel locomotives from Fried. Krupp AG, Essen, West Germany. The order is worth some DM 2,900,000, this sum approximating the 3,000,000 Swiss francs loaned to the Greek Railways by the Eurofima financing body.

Proceeds from a new Eximbank loan of $2,560,000 (US) to the Greek Railways will be used to help finance purchase of 10 diesel locomotives from the American Locomotive Co. (US).

▶ *Iran*—A Japanese delegation arrived in Teheran last month to negotiate sales of locomotives and other railway equipment.

▶ *Italy*—Italian State Railways plan to place orders worth six billion lire with Italian firms for 1000 refrigerated rail cars.

CONTINUED ON PAGE 21

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# WORLD REPORT

## World Bank Loans

More than half the funds loaned by the World Bank in the year ended 30 June 1961 were in transportation. The bank's annual report, made public in Vienna in September, showed a total of 11 transport loans were made, totaling $311,000,000 (US). Largest of these were made to India ($70,000,000) and Japan ($80,000,000)—both for railways. Other railway loans were made to Burma, Colombia and Thailand. The annual report noted that in the 15 years since the bank was formed, more than two-thirds of its lending has been for transportation and electric power; and in the past few years "loans for transportation have been slowly drawing ahead." Last month there was evidence that this trend would continue. Another World Bank loan of $50 million was granted to India for railway development.

**AUSTRALIA:** The Queensland Railways have become the first Australian system to operate stainless steel suburban rolling stock. First deliveries of an order for 13 seven-car trains are being made by Commonwealth Engineering Pty. Ltd., a Budd Co. licensee. The cars seat 64 in three saloons separated by wide vestibules. Capacity of each train, including standees, is 995. The new equipment will be used initially for locomotive hauled services but has been designed for easy conversion to multiple-unit operation if and when QR decides to electrify its suburban system.

**BRAZIL:** The Brazilian government has issued a directive to federal and private enterprises to the effect that preference should be given to rail transport, especially to the Rede Ferroviaria Federale. Some organizations had already begun to implement the contents of the decree before its publication. The Cia Siderurgica Nacional, for example, is reported to have withdrawn 180 trucks. As of 1 September all rail tariffs, with exception of surburban fares, were increased 20%.

**CANADA:** The Canadian National Railways has begun installation of concrete sleepers for test purposes on a section of main-line track in Quebec. Two types of concrete sleepers are being placed in position on a 1.6-km length of track near Drummondville. The existing rail will be replaced with continuous welded rail and new wooden sleepers will be placed in the middle of the test section for control purposes. A total of 1800 concrete sleepers—800 of US design and 1000 made in Canada from French design—will be tested.

**EAST AFRICA:** The Transport Advisory Council and its Railway and Harbours standing committees have approved new projects totaling £700,000. Projects approved include extension of the line now being built from Soroti to Gulu to the east bank of the Nile at Pakwach, and the expenditure of £325,000 on the conversion of vehicles and locomotives on the Tanganyika Central Line and the Kenya-Uganda and Tanga sections from vacuum to air brakes.

. . . The Giesel ejector is rapidly winning a place on the EAR which still operates a large number of steam locomotives. A few years ago EAR equipped 17 of its 58 class locomotives with Giesel ejectors. Following a striking increase in efficiency, EAR now plans to fit 12 57 class Garratts with ejectors at a cost of £7,200.

**EUROPE:** Promotion of the Eurailpass, which is valid for unlimited first-class travel on 13 European rail networks, will be expanded in the Western Hemisphere. Also under consideration is a plan to extend the pass to cover British Railways and certain shipping lines.

**FINLAND:** A special Government committee has given its support to a Railway Board's recommendation calling for electrification of approximately 990 km of high-density railway line. The program would be carried out in three stages.

**GABON:** Preliminary planning of an important new railway is scheduled to begin late this year. Engineering surveys for the rail route will require about two years. The new line—probably exceeding 325 km—would transport iron ore from northeast Gabon to new harbor facilities near Libreville. Cost of the railway and harbor is now estimated at approximately $350,000,000 (US).

**INDIA:** The first Indian-built DC locomotive, which was constructed at the Chittaranjan Locomotive Works, will operate on the suburban section of India's Central Railway in the Bombay area. The mechanical parts of the 3600-hp locomotive were fabricated in India while the electrical components were supplied by the English Electric Co. Ltd.

. . . Carloadings on the Indian Railways for the six-month period ending July, 1961, increased over the same period last year. Loadings on broad-gauge lines were up 5.4%, on meter-gauge lines, 2.5%. Coal loadings were up 16.8% in the Bengal and Bihar coalfields and 5.8% in the outlying coalfield areas.

**KENYA:** A special economic mission, sponsored by the World Bank, is presently in this country to assist in formulation of a program designed to stimulate and expand economic growth. The 10-man group, which began field work in Nairobi on 20 Sept., includes a transportation adviser from France, M. Marc E. Langevin. M. Langevin, consultant engineer with Société d'Études Techniques et Economiques, was formerly a top official with the Paris Transport Authority. He also served as general manager of the Paris Subway Company.

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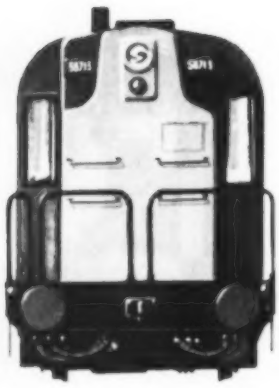
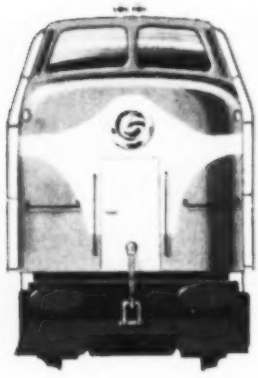
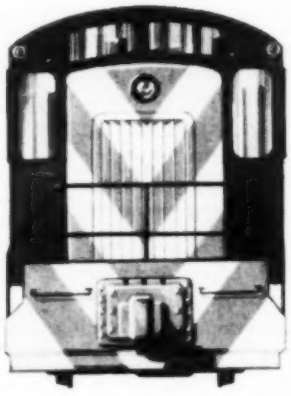
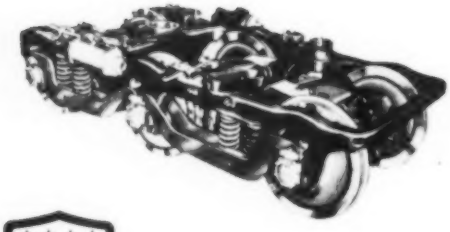
# FREIGHT, PASSENGER, SHUNTING DIESEL LOCOMOTIVES







## *all ride on* COMMONWEALTH BOGIES



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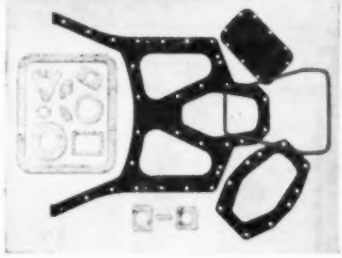

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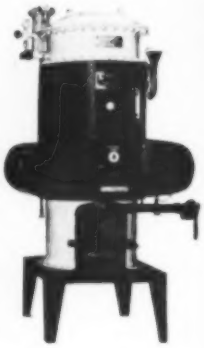
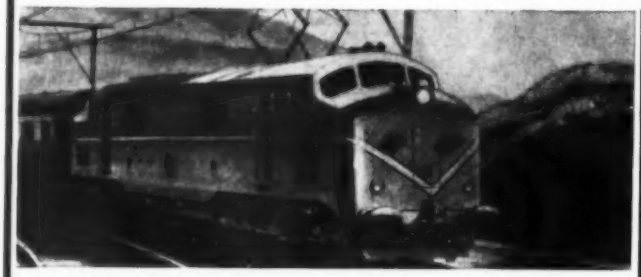
BG 379

# STREAM-LINE FILTERS



EDGE-TYPE FILTERS

*Illustrated above is a selection from the standard range of pressure operated edge-type filters.*



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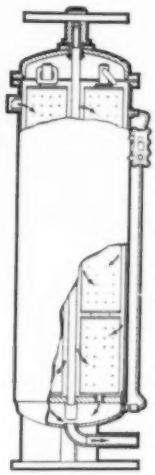

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S.F.III

# WORLD POLL

**Plans for 1962 capital spending programmes are being progressed on railways in all countries. Still subject, in most cases, to final approval, the accompanying tables are an indication of what railways are planning for the next 12 to 18 months in new and improved facilities and rolling stock.**

**A travers le monde entier, les chemins de fer établissent actuellement leur programme d'inventissements pour 1962. Bien que la plupart des tableaux ci-joints ne soient pas encore approuvés, ils donnent, cependant, une indication du montant envisagé pour la modernisation des installations et du matériel, au cours des 12 à 18 prochains mois.**

**Die Eisenbahnen aller Länder sind dabei, ihre Wirtschaftspläne für das Jahr 1962 aufzustellen. Sie bedürfen in den meisten Fällen noch der endgültigen Genehmigung. Aus den beiliegenden Tabellen ist zu ersehen, was die Eisenbahnen in den nächsten 12 bis 18 Monaten hinsichtlich neuer und verbesserter Anlagen und Fahrzeuge planen.**

**En los ferrocarriles del mundo entero se están formulando los planes para las inversiones capitales durante 1962. Aunque pendientes todavía de la aprobación final, los datos contenidos en estas tablas dan una indicación de lo que planean las empresas ferroviarias para mejorar sus instalaciones y material rodante durante el siguiente año o año y medio.**

•

## CAMINHOS DE FERRO E TRANSPORTES DE ANGOLA

| Total: 25,000 Escudos* | |
|---|---|
| Major track improvements | 12,600 Escudos |
| Communications | 500 Escudos |
| Shop and repair facilities | 700 Escudos |
| Bridges and buildings | 8,500 Escudos |
| Other expenditures | 2,700 Escudos |

* 100 Escudos = **$ 3.49** US.

## CIA MOGIANA DE ESTRADA DE FERRO (BRAZIL)

| Total: 292,000,000 Cruzeiros* | |
|---|---|
| Passenger cars | 40,000,000 Cruzeiros |
| New line construction | 150,000,000 Cruzeiros |
| Major track improvements | 50,000,000 Cruzeiros |
| Bridges and buildings | 30,000,000 Cruzeiros |
| Other expenditures | 20,000,000 Cruzeiros |

* 100 Cruzeiros = **$ .35** US.

## CEYLON GOVERNMENT RAILWAY

| Total: Rs 34,274,440* | |
|---|---|
| Locomotives | Rs 3,299,010 |
| Passenger Cars / Freight Cars | Rs 3,261,000 |
| New line construction | Rs 7,000,000 |
| Major track improvements | Rs 10,580,000 |
| Electrification / Signaling | Rs 2,400,000 |
| Communications | Rs 5,000 |
| Yards and terminals | Rs 2,000,000 |
| Shop and repair facilities | Rs 1,168,980 |
| Bridges and buildings | Rs 3,333,440 |
| Other expenditures | Rs 1,227,010 |

* Rs 100 = **$ 21** US.

## EAST AFRICAN RAILWAYS AND HARBOURS

| Total: £ 8,068,011* | |
|---|---|
| Locomotives | £ 53,200 |
| Passenger cars (coaching stock) | £ 380,575 |
| Freight cars | £ 980,490 |
| New line construction | £ 1,410,000 |
| Major track improvements | £ 2,005,800 |
| Communications | £ 141,350 |
| Yards and terminals | £ 45,500 |
| Shop and repair facilities | £ 309,780 |
| Bridges and buildings | £ 694,100 |
| Other expenditures | £ 2,047,216 |

* £ 100 = **$ 280** US.

## GHANA RAILWAY

| Total: £ 1,407,540* | |
|---|---|
| Locomotives | £ 41,150 |
| Passenger cars | £ 64,000 |
| Freight cars | £ 55,000 |
| New line construction | £ 4,000 |
| Major track improvements | £ 721,760 |
| Signaling | £ 71,900 |
| Communications | £ 16,010 |
| Yards and terminals | £ 54,160 |
| Shop and repair facilities | £ 120,120 |
| Bridges and buildings | £ 165,570 |
| Other expenditures | £ 93,870 |

* £ 100 = **$ 281** US.

CONTINUED ON PAGE 15

◀ BRITISH RAILWAYS: A fleet of 250 specially designed box cars for handling palletized freight and incorporating built-in inflatable dunnage, is being constructed by BR. The vehicles—designated Palvans—are the result of close cooperation between BR and one of the system's biggest customers, Newton, Chambers & Co., Ltd. The Palvan is partitioned into four compartments and each compartment takes two pallet loads. Four easily-sliding doors on each side of the car provide fork-lift access to the interior. The air dunnage system is a new development in Britain. Compressed air, available from supply lines in the loading bay, is used to inflate plastic containers fitted in the compartments. Inflation can be varied to suit the load in order to provide complete cushioning and prevent movement of the packed products during transit.

# News briefs in pictures . . .

SOUTH AFRICA: Electrification ▶ projects on SAR will soon give locomotive manufacturers another big order. Earlier this year delivery was completed of 135 class 5E1 Bo-Bo units of 2200 hp, built by Associated Electrical Industries. Total cost of the units was just under £8,000,000. Now tenders are being invited for another 130 locomotives of the same class. Commenting on this latest call for bids, General Manager J. P. Hugo said, "This can be regarded as a challenge to South African industry. So far electric main-line units have not been built in South Africa, but recent advances in the capacity of the heavy engineering industry as well as in the manufacture of electrical equipment may find in this substantial new railway order a field for initiative."

LONDON TRANSPORT: An under- ▶ floor lathe for machining railway wheels without removing them from the vehicle has been brought into use at the Northfield Depot. Designed and constructed by the Scottish Machine Tool Corp., Ltd., to London Transport specifications, the lathe embodies a number of new features. Drive is applied to the wheels by two pairs of rollers on vertical axles. The rollers are pressed hydraulically against the inner and outer faces of each tyre. The two drive-rollers exert balanced forces on each wheel and no end thrust is applied to the axle. Low cost tool equipment has been specially developed.

## FERROCARRIL DEL PACIFICO DE NICARAGUA

Total: $ 3,256,431 (US)

| | |
|---|---|
| Locomotives | $ 2,109,429 |
| Major track improvements | $ 663,716 |
| Signaling / Communications | $ 9,000 |
| Shop and repair facilities | $ 474,286 |

## INDONESIAN STATE RAILWAYS

Total: 2,288 million Rupias*

| | |
|---|---|
| Locomotives | 206 mil. Rupias |
| Passenger cars | 692 mil. Rupias |
| Freight cars | 460 mil. Rupias |
| Major track improvements | 608 mil. Rupias |
| Signaling | 60 mil. Rupias |
| Communications | 6 mil. Rupias |
| Yards and terminals | 50 mil. Rupias |
| Shop and repair facilities | 71 mil. Rupias |
| Bridges and buildings | 21 mil. Rupias |
| Other expenditures | 114 mil. Rupias |

* 100 Rupias = $ .22 US.

## ISRAEL RAILWAYS

Total: I£ 4,200,000*

| | |
|---|---|
| New line construction | I£ 3,500,000 |
| Shop and repair facilities | I£ 200,000 |
| Other expenditures | I£ 500,000 |

* I£ 100 = $ 56 US.

## KEI-HAN-SHIN KYUKO RAILWAY

Total: 8,862 million yen*

| | |
|---|---|
| Passenger cars | 1,465 mil. yen |
| New line construction | 4,095 mil. yen |
| Major track improvements | 150 mil. yen |
| Electrification | 194 mil. yen |
| Signaling | 139 mil. yen |
| Communications | 41 mil. yen |
| Yards and terminals | 2,706 mil. yen |
| Shop and repair facilities | 30 mil. yen |
| Other expenditures | 42 mil. yen |

* 100 yen = $ .28 US.

## VITÓRIA MINAS RAILWAY

Total: $ 17,270,136 (US)

| | |
|---|---|
| Locomotives | $ 546,000 |
| Freight cars | $ 8,206,896 |
| Major track improvements | $ 6,896,551 |
| Signaling | $ 689,655 |
| Communications | $ 172,414 |
| Yards and terminals | $ 68,965 |
| Shop and repair facilities | $ 689,655 |

## MANILA RAILROAD COMPANY

Total: 24,618,837 Pesos*

| | |
|---|---|
| Locomotives | P 1,329,837 |
| Passenger cars | P 569,000 |
| Freight cars | P 1,415,000 |
| New line construction | P 10,000,000 |
| Major track improvements | P 1,500,000 |
| Signaling | P 1,000,000 |
| Communications | P 600,000 |
| Yards and terminals | P 1,500,000 |
| Shop and repair facilities | P 490,000 |
| Bridges and buildings | P 2,500,000 |
| Other expenditures | P 3,715,000 |

* 100 Pesos = $ 33.5 US.

## NEW ZEALAND RAILWAYS

Total: £NZ 7,346,575*

| | |
|---|---|
| Locomotives | £ 900,000 |
| Passenger cars (coaching stock) | £ 141,500 |
| Freight cars | £ 1,778,500 |
| Major track improvements | £ 673,200 |
| Signaling | £ 158,100 |
| Communications | £ 59,500 |
| Yards and terminals | £ 1,065,005 |
| Shop and repair facilities | £ 232,960 |
| Bridges and buildings | £ 691,560 |
| Other expenditures | £ 1,646,250 |

* £NZ 100 = $ 281 US.
Figures are for current fiscal year ending 31 March, 1962.

## QUEENSLAND GOVERNMENT RAILWAYS

Total: £A 4,200,000*

| | |
|---|---|
| Locomotives | £ 316,570 |
| Passenger cars | £ 1,260,500 |
| Freight cars | £ 231,580 |
| Major track improvements | £ 629,400 |
| Signaling | £ 496,900 |
| Communications | £ 34,000 |
| Yards and terminals | £ 91,420 |
| Shop and repair facilities | £ 171,550 |
| Bridges and buildings | £ 258,550 |
| Other expenditures | £ 709,530 |

* £A 100 = $ 225 US.

## SAUDI GOVERNMENT RAILROAD

Total: 7,876,250.00 Saudi Riyals*

| | |
|---|---|
| Locomotives | 787,500 Riyals |
| Major track improvements | 3,000,000 Riyals |
| Signaling | 56,250 Riyals |
| Communications | 112,500 Riyals |
| Yards and terminals | 3,750,000 Riyals |
| Shop and repair facilities | 170,000 Riyals |

* 100 Saudi Riyals = $ 23 US.

CONTINUED ON PAGE 56

# CSR Designs New Motive Power

**The Czechoslovakian State Railways are, like most other European systems, in the process of changing from steam traction to diesel and electric traction. Since 1957 the construction of steam locomotives has gradually been abandoned. Conversely, the production of diesel and electric units is steadily being stepped up. For diesel traction a number of different designs have been developed to cover traffic requirements from the low horsepower shunting locomotive to more powerful main-line units. In 1960 nearly 300 diesel locomotives of various kinds were built for the Czechoslovakian State Railways, all being examples from the standard range. Some of these designs, from the small T 211.0 165 hp shunting locomotive to the T 698.0 and T 658.0 1650-hp main-line units, are described in this feature.**

The standard range of diesel power developed so far for the Czechoslovakian State Railways begins with a 165-hp shunting locomotive and ends with a 1650-hp main-line unit which can be operated in multiple-unit. Apart from the small 165-hp unit, which has mechanical transmission, all other designs have electric or hydraulic transmissions. Initially the electric transmission was favored, but the more recent examples have tended to incorporate hydraulic transmissions.

The smallest design in the range is the series T 211.0—a four-wheeled diesel-mechanical shunting locomotive for use at smaller stations or for servicing industrial sidings. The frame is an all-welded structure with a cab at one end. The cab is insulated and sound-proofed and has a single entrance at the rear. There are two sets of controls, enabling the unit to be driven in either direction from either side of the cab. Air brakes of the Božič-Westinghouse pattern are provided, supplemented by direct-acting compressed air brake for the locomotive only and a hand brake.

Both driving axles are mounted on roller bearings. The gearbox has four speeds and is pneumatically controlled. There is a dry, multi-plate friction clutch. Both axles are driven, by shafts from the gearbox, through bevel gears.

The engine is a 12-cylinder V-type air-cooled unit with an output of 165 hp at 1,600 rpm. Each of the finned cylinders, with cylinder head, is mounted separately on the crankcase. The crankshaft is a forged section on roller bearings. Cooling is by two axial fans, driven by V-belts

One of the most powerful diesels so far placed in service with CSR is the T 698.0 Co-Co diesel electric designed for passenger train service. Maximum speed, 120 km/h; weight, 107 metric tons; axle-load, 18 metric tons

from the crankshaft and the cooling air is led from the fans through cowlings to the cylinders. The engine can be started by either of two independent electric starters which are provided. The cylinders have a bore of 110 mm and a stroke of 130 mm.

One of the first diesel designs to be developed was the T 435.0, a multi-purpose Bo-Bo diesel-electric locomotive. With a 750-hp engine it can be used for shunting work, line haulage of light freight trains and also for selected passenger train duties, where train heating is not necessary. Apart from the Czechoslovakian State Railways, the T 435.0 has also been supplied to a number of other eastern bloc countries and the design is such that it can be readily adapted to suit various gauges.

The T 435.0 is a hood unit, with the cab at one end. Frame and body are of welded construction. The bogies are partly made up of cast steel parts and partly of fabricated components. Springing is by laminated and coil springs.

The cab is supplied with a door on to the rear platform and one opening forward alongside the engine hood. The full set of driving controls are placed on the right hand side of the cab. A simplified set of controls are fitted in the opposite diagonal corner.

The power unit is the type 6S 310 DR four-stroke, six-cylinder, in-line, water-cooled diesel engine. The engine develops 750 hp and the cylinder bore and the stroke are 310 mm and 360 mm respectively. The main generator is direct-coupled to the diesel engine and is an eight-pole machine. The four-pole traction motors are connected in pairs in series. They are nose-suspended.

Of newer design than either the T 211.0 or T 435.0 is the T 444.0. This is a 700-hp Bo-Bo unit with hydraulic transmission. It follows the general trend in having the cab amidships and placed well above the top of the hoods. This type of "conning tower cab" provides much better all-round visibility. The T 444.0 is primarily intended for freight duties as a shunting locomotive and for line service. The cab has been laid out for one man operation and two sets of controls, placed diagonally, are provided. Special attention has been paid to sound insulation and heating for the comfort of the driver. Entrance doors are on either side of the cab and windows are provided on all sides.

The forward hood contains the diesel engine which is a type K12V 170DR with an output of 700 hp at 1400 rpm. A 12-cylinder V-type water-cooled design, it has superchargers of Czech manufacture, type PDH 16S. The engine output is controlled through electro-mechanical

CONTINUED

## Locomotives diesel tchécoslovaques

**Les Chemins de fer de l'État tchécoslovaque passent de la traction à vapeur à la traction diesel et électrique. Depuis 1957, ils renoncent progressivement à la construction de machines à vapeur et accroissent celle de véhicules moteurs diesel et électriques. Pour la traction diesel, ils ont étudié suivant les besoins de l'exploitation plusieurs types de machines allant des locomotives de manoeuvre d'un petit nombre de CV aux locomotives de ligne les plus puissantes. En 1960, près de 300 locomotives diesel de divers modèles ont été construites pour eux, dont les séries T 698.0 et T 658.0 sont actuellement les plus puissantes unités en service. La première série, destinée aux trains de voyageurs, atteint une vitesse de 120 km/h; la seconde, conçue pour les trains de marchandises, peut rouler à 85 km/h. Les deux séries ont des moteurs de huit cylindres du type K8S 310DR, d'une puissance continue de 1650 CV à 720 tours-minute. Le type le plus petit, de la série T 211.0, est une machine de manoeuvre diesel-mécanique ayant un moteur de douze cylindres à réfrigération à air, développant une puissance de 165 CV à 1600 tours-minute. Cette machine travaille dans les petites gares et sur les lignes privées. Les types de véhicules moteurs diesel susmentionnés ont été conçus et construits dans les usines CKD, centre de la construction des locomotives diesel en Tchécoslovaquie.**

## Tschechoslowakische Diesellokomotiven

**Die Zugförderung der Tschechoslowakischen Staatseisenbahnen (CSD) geht von Dampf zu Diesel und zur Elektrizität über. Seit 1957 ist der Bau von Dampflokomotiven allmählich eingestellt und der von Dieseleinheiten sowie elektrischen Triebfahrzeugen erhöht worden. Für die Dieseltraktion wurden, je nach den betrieblichen Bedürfnissen, mehrere Bauarten entwickelt, von der wenig PS aufweisenden Rangiermaschine bis zur starken Linienlokomotive. Im Jahre 1960 sind für die CSD nahezu 300 Diesellokomotiven verschiedener Art gebaut worden, wovon bis heute als stärkste Einheiten die Serien T 698.0 und T 658.0 im Dienste stehen. Die erste Serie, die Personenzügen dient, erreicht eine Geschwindigkeit von 120 km/h, die zweite, die Güterzüge führt, eine solche von 85 km/h. Beide Serien besitzen Achtzylindermotoren des Typen K8S 310DR, der eine Dauerleistung von 1650 PS bei 720 U/min. entwickelt. Die kleinste Bauart, Serie T 211.0, ist eine zweiachsige diesel-mechanische Rangiermaschine mit luftgekühltem Zwölfzylindermotor, der bei 1600 U/min. 165 PS leistet. Diese Maschine ist für den Dienst auf kleinen Stationen und Privatgleisen bestimmt. Die erwähnten Dieseltriebfahrzeugtypen wurden in den CKD-Werken, im Zentrum des tschechischen Diesellokomotivbaus, entwickelt und hergestellt.**

## Checoeslovaquia: Locomotoras Diesel

**Los Ferrocarriles del Estado Checoeslovacos están convirtiendo la tracción de vapor en las de Diesel y eléctrica y desde 1957 la construcción de locomotoras de vapor ha sido suspendida poco a poco y la producción de locomotoras Diesel y unidades eléctricas ha incrementado incesantemente. Para la tracción Diesel se han desarrollado diferentes diseños con el fin de satisfacer a las exigencias del tráfico—desde la locomotora de maniobras de pocos CV hasta la unidad de línea más fuerte. En 1960 fueron construídas casi 300 locomotoras Diesel de varios tipos para los FC del Estado. Las unidades más fuertes son las de los tipos T 698.0 y T 658.0; ésa es destinada al servicio de pasajeros y aquélla al tráfico de carga. La T 698.0 tiene una velocidad máxima de 120 km. p.h. y la T 658.0 de 85 km. p.h. Las dos son accionadas por una máquina K8S 310DR de ocho cilindros, energía producida 1650 CV a 720 rpm. El diseño mas pequeño es la serie T 211.0, locomotora de maniobras Diesel-mecánica de cuatro ruedas, la que se utilizará en pequeñas estaciones y ramales industriales. La máquina es una unidad de 12 cilindros tipo V, enfriada de aire, energía producida 165 CV a 1600 rpm. Los tres tipos han sido desarrollados y construídos en los talleres CKD de Praga, punto central de la producción de locomotoras Diesel en Checoeslovaquia.**

**T 435.0**

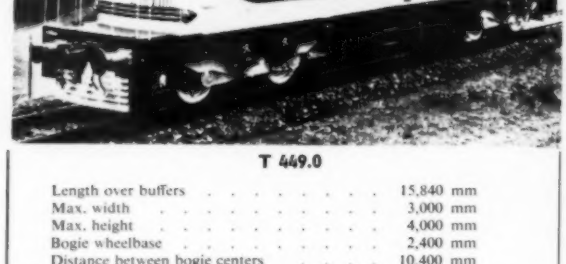
| | |
|---|---|
| Length over buffers | 12,440 mm |
| Max. width | 3,000 mm |
| Max. height | 4,000 mm |
| Bogie wheelbase | 2,400 mm |
| Distance between bogie centers | 6,300 mm |
| Driving wheel diameter | 1,000 mm |
| Minimum radius curve | 70 meters |
| Weight in working order | 65 metric tons |
| Maximum axleload | 15 metric tons |
| Max. speed | 70 km/h |
| Max. tractive effort | 18,000 kg |
| Fuel oil capacity | 2,300 liters |
| Lubricating oil capacity | 300 liters |

**T 449.0**

| | |
|---|---|
| Length over buffers | 15,840 mm |
| Max. width | 3,000 mm |
| Max. height | 4,000 mm |
| Bogie wheelbase | 2,400 mm |
| Distance between bogie centers | 10,400 mm |
| Driving wheel diameter | 1,050 mm |
| Minimum radius curve | 100 meters |
| Weight in working order | 80 metric tons |
| Max. speed (for shunting) | 35 km/h |
| Max. speed (for line service) | 70 km/h |
| Fuel oil capacity | 6,000 liters |

**T 475.0**

| | |
|---|---|
| Length over buffers | 15,840 mm |
| Max. width | 3,000 mm |
| Max. height | 4,000 mm |
| Bogie wheelbase | 2,400 mm |
| Distance between bogie centers | 10,400 mm |
| Driving wheel diameter | 1,000 mm |
| Minimum radius curve | 100 meters |
| Weight in working order | 64 metric tons |
| Max. speed (for shunting) | 50 km/h |
| Max. speed (for line service) | 100 km/h |
| Fuel oil capacity | 3,000 liters |



**T 444.0**

| | |
|---|---|
| Length over buffers | 12,640 mm |
| Max. width | 3,000 mm |
| Max. height | 4,000 mm |
| Bogie wheelbase | 2,400 mm |
| Distance between bogie centers | 7,200 mm |
| Driving wheel diameter | 1,000 mm |
| Minimum radius curve | 100 meters |
| Weight in working order | 52 metric tons |
| Max. axleload | 13 metric tons |
| Max. speed (for shunting) | 35 km/h |
| Max. speed (for line service) | 70 km/h |

## CZECH DIESELS CONTINUED

means. The dynostarter, auxiliary generator and air brake compressor are all driven off the free end of the engine shaft. Also in the forward hood are the main and auxiliary air tanks and the starter battery.

Under the rear hood is the cooling equipment for the diesel engine and the hydro-dynamic transmission. The engine cooling equipment is in two sections, each with its own electrically-driven fan. Air is drawn in through grilles mounted on the hood sides and blown out through the roof. Cooling water temperature is automatically controlled by thermostats.

The hydro-dynamic transmission of type H 65 Lr is linked to the diesel engine by a cardan shaft. The transmission has three converters and two speed ranges—maximums being 35 km/h and 70 km/h—depending on the duties being performed. A change of speed range and a change from forward to reverse can only be carried out when the locomotive is stationary. The transmission is located centrally below the cab and the final drive is by cardan shafts to the inner axles of each bogie. There are further drives from the inner axles to the outer axles.

The four-wheeled bogies have roller-bearing axle-boxes of the SKF type and the frames are of welded construction. The welded frame rests on the bogies through a four point suspension system. Bogie springing is by swing arms mounted on silentblocs and helical springs and hydraulic shock absorbers. Air brakes act on all wheels, air being provided by a two stage compressor.

The T 444.0 is now in series production while another version—T 444.1— equipped with train heating apparatus, is about to enter production.

Two closely related center cab diesel-hydraulic designs are the Bo-Bo T 449.0 and T 475.0 locomotives. The T 449.0 is for heavy duty shunting and is equipped with two water-cooled 12-cylinder V-type engines of type K12V 170DR (similar to the one in the T 444.0 design),

each having an output of 650 hp. The engines are equipped with turbo-blowers. The hydro-dynamic transmission is also similar to that used in the T 444.0 design, except that one set is provided for each engine.

The T 475.0 is principally for line service and is lighter in weight and has higher maximums in both speed ranges.

The most powerful diesel locomotives so far placed in service are those of classes T 698.0 and T 658.0. The former is intended for passenger train haulage and the latter for freight train duties, both examples being basically identical and having electric transmission. The T 698.0 type has a maximum speed of 120 km/h and the T 658.0 a top speed of 85 km/h. The power unit is a K8S 310DR eight-cylinder engine having a continuous output of 1650 hp at 720 rpm. Cylinder bore is 310 mm and stroke is 360 mm. The main generator is directly coupled to the diesel engine and is an eight-pole DC machine with separate main excitation and an auxiliary series excitation which is for starting the diesel engine. The rated output of the generator is 1020 kw. Maximum voltage at full output is 800 volts. The generator provides current for the six traction motors which are series-wound six-pole type. Power is controlled by an electro-hydraulic governing system making possible the full utilization of engine output within the speed range.

Axial fans for radiator cooling and centrifugal fans for cooling traction motors are driven by single-phase AC motors fed from an alternator mounted at one end of the main generator.

There is a cab at one end of the unit only, while at the opposite end is a compartment incorporating a WC, washbasin and tool cabinet. Two of these locomotives can be operated in multiple unit.

The latest electrical locomotive design for the Czechoslovakian State Railways is the E 689 series for use on lines electrified at 3000 volts DC. The design is 18.8 meters long, has a tare weight of 118.5 metric tons and an hourly output at 60 km/h of 4800 hp. Maximum speed is 120 km/h.

Rail traffic continues to increase in Czechoslovakia. Between 1945 and 1960 freight traffic was boosted by 235% and passenger traffic by 88%. In this same period the system took delivery of 1169 steam locomotives, 886 diesel and 178 electric locomotives, 68,000 freight cars and 3279 passenger cars. Between now and 1965 it is anticipated that a further 1053 km of line will be electrified and that the system will take delivery of 1000 diesel electrics, 288 electric locomotives, 1700 high capacity freight bogie cars and 2690 passenger cars.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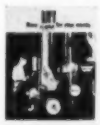

**FREE:** Bulletin PJC-403 gives complete details on Whiting Electric Portable Jacks. Write for your copy to: Whiting Corporation, 15679 Lathrop Avenue, Harvey, Illinois.

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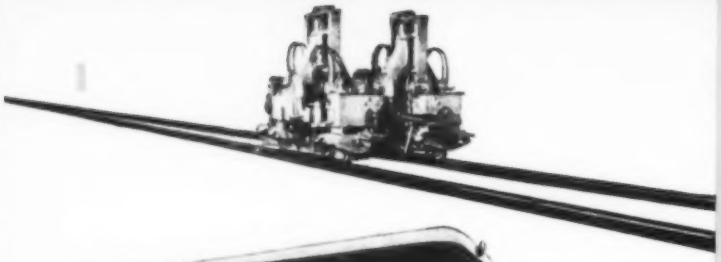
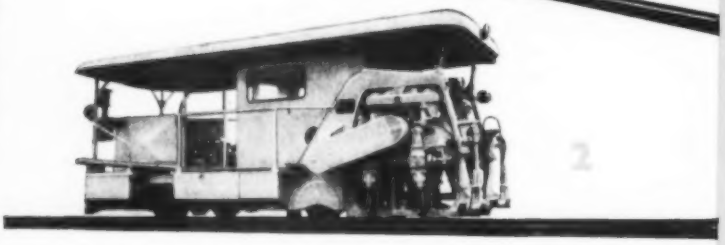
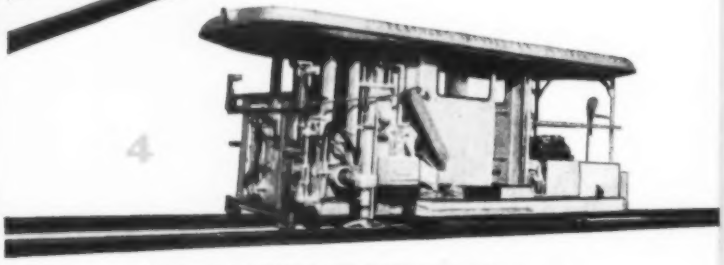
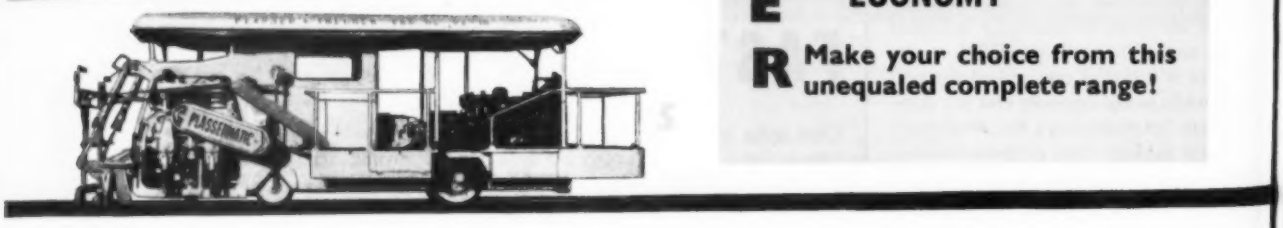
RAILROAD EQUIPMENT









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**A** (2) High Speed Tamper VKR-03

**S** (3) Streamlined VKR-03 FI Noise reduced

**S** (4) Plassermatic 300 Universal Economy Tamper

**E** (5) Plassermatic VKR-04 High Capacity Tamper

**R** (6) Streamlined VKR-04 Spec. with self propelled front dolly

**&**

# TAMPERS

**H** Designed to suit the needs of the railways of all countries

**E** Designed for

**U** HIGH SPEED

**R** QUALITY

**E** ECONOMY

**R** Make your choice from this unequaled complete range!

**137** Plassermatics have been sold since 1960

# PLASSER & THEURER

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## SUMMARY

Quality pays!

So far 137 PLASSERMATICS have been sold to the following countries:

- Austria
- Australia
- British East Africa
- Canada
- Czechoslovakia
- Denmark
- England
- France
- Finland
- Hungaria
- Ireland
- Italy
- Mozambique
- Netherlands
- New Zealand
- Norway
- Spain
- South Africa
- Switzerland
- Tunesia
- U.S.A.
- Western Germany

## RESUMEE

Qualität macht sich bezahlt!

137 PLASSERMATICS wurden bis jetzt in folgende Länder verkauft:

- Österreich
- Australien
- British-Ostafrika
- Kanada
- Tschechoslowakei
- Dänemark
- England
- Frankreich
- Finnland
- Ungarn
- Irland
- Italien
- Mosambik
- Niederlande
- Neuseeland
- Norwegen
- Spanien
- Südafrika
- Schweiz
- Tunesien
- U.S.A.
- West-Deutschland

## RÉSUMÉ

La qualité rapporte!

Jusqu'à ce jour 137 PLASSERMATICS ont été vendus dans les pays suivants:

- Autriche
- Australie
- Afrique Orientale Anglaise
- Canada
- Tchéchoslovaquie
- Danemark
- Grande-Bretagne
- France
- Finlande
- Hongrie
- Irlande
- Italie
- Mozambique
- Pays-Bas
- Nouvelle-Zélande
- Norvège
- Espagne
- Afrique du Sud
- Suisse
- Tunisie
- E.U.A.
- Allemagne Occidentale

**Plasser & Theurer**

## World Market CONTINUED

▶ *Indonesia*—The Strojexport State trading organization of Czechoslovakia has announced details of orders received earlier this year from the Indonesian Railways (p. 17, IRJ, July). The order, as reported by Strojexport, is for 1000 closed freight cars, 500 open cars, 500 tank cars and 500 wooden cars. The Czech body also reports Indonesia has ordered machinery for the equipping of a car construction plant at Pasuruan in Java.

▶ *Japan*—Japanese National Railways ordered four automatic ballast tampers from Matisa (Matériel Industriel SA). The units will be fitted with automatic leveling equipment. Two machines will be standard-gauge; two will be narrow-gauge.

Kinki Nippon Railway Co. ordered two heavy-duty ballast tampers from Matisa.

▶ *Mauretania*—Contractors for MIFERMA railway line have ordered two speedtampers, one with automatic leveling equipment; and one track recording trolley, all from Matisa. New machines will complement ballast tampers and other equipment previously acquired for use in building a new line from Port Étienne to Fort Gouraud. A Matisa rail-welding installation is also in operation on the project.

▶ *Paraguay*—A new 400-km railway, extending eastward from Asuncion to the Brazilian border town of Guaira, is being considered. At Guaira the new line would connect with the existing rail network of Brazil. Negotiations between Brazil and Paraguay on construction of a new bridge across the Paraná River, which would be utilized by the proposed rail line, are said to be imminent. The Paraná provides a portion of the border between the two countries.

▶ *Philippines*—Government approval has been granted to a proposal to construct a railway line from Legaspi to Mantog. The project is part of a broad economic program to be financed by bond issues totaling approximately 150,000,000 pesos ($75,000,000 US). The Department of Public Works, Manila, will supervise the work.

Construction has reportedly begun on 336-km extension of the Manila Railroad Co. line north of Manila to Tuguegareo. Present northern terminal is at San Jose. Initial Funds for the project are being provided by a loan from Japan.

▶ *Spain*—The Spanish National Railways has ordered two snow blowers from Rolba AG of Switzerland. The units are diesel-powered and equipped with rotary plows. Delivery is scheduled for 1962.

▶ *UAR (Egypt)*—Obtained approval of an Eximbank loan of $75,000 (US) for use in acquiring railway track equipment from Fairmont Railway Motors, Fairmont, Minn., USA.

▶ *Viet Nam*—Will purchase 23 diesel-electric locomotives in the US, with financing being arranged through the Development Loan Fund, a US agency. Deadline for bids: 15 Nov.

▶ *West Germany*—The German Federal Railways will place next year DM 109,000,000 worth of orders with West Berlin firms under a credit-financed supplementary program aimed at supporting West Berlin industry. The supplementary program for 1961 amounted to DM 100,000,000 covering the purchase of passenger cars, electric railcars, freight cars and electrical equipment.

# Brazil Sets Record on Ore Run

**A series of experiments, now under way for almost three years, have been carried forward on the Vitória-Minas Railway in Brazil to determine the most efficient methods for volume movement of iron ore.**

As a part of these studies, the railway earlier this year handled what was perhaps the heaviest narrow-gauge train ever run. The train was 8064 net tons (metric), with gross tonnage of 10,480. Overall length of the train was 1182 m.

This record train consisted of 112 gondola-type ore cars, each with 72 metric tons capacity (18 tons tare), followed by an observation car. Motive power was provided by five Electro-Motive (GM) diesel-electric B-B locomotives, operating in multiple.

Total elapsed time on the trip of 570 km was 16 hours, which gives an average speed of 35.6 km/h. The top speed, sustained over level stretches of track, was 55 km/h.

The Vitória-Minas is a meter-gauge railway extended from Itabira, the site of rich iron ore deposits in the state of Minas Gerais, to the port city of Vitória on the Atlantic ocean. The line is a subsidiary of Cia. Vale do Rio Doce S.A., a government-controlled ore export company.

The experiments aimed at improving ore-train operations were originally undertaken to meet the railway's goal of handling approximately 6 million tons of ore in 1961. For this purpose it was found that trains comprised of four type G-12 locomotives and 108 50-ton cars, or 96 72-ton cars, were the best solution. However, the tonnage goal for 1961 was a temporary one. It is now anticipated that carrying capacity of the railway must, in the future, be increased to 20 million tons of ore annually. It was toward this objective that the 112-car train was operated. In view of the favorable results on this test, it is believed that trains with as many as 150 loaded cars can be handled safely.

The five locomotives on the record ore train were equipped with Westinghouse Air Brake Company's type 26-L brake equipment. This equipment incorporates the pressure maintaining feature which is of great help in the mountainous portion of the railway. All cars on the record ore train were equipped with Westinghouse AB empty and load type air brakes.

Brake tests made prior to the departure from Itabira showed a leakage of 2.5 psi/min (0.1758 kg/cm²/min), and a gradient of only 3 psi (0.2109 kg/cm²) between the lead locomotive and the last car, indicating the excellent state of the brake system.

The 570-km track between Itabira and Vitória includes a mountain section, about 83 km in length, with descending grades up to 2% in the direction of export. The descent of this grade was made easily and safely by the heavy ore train. Speeds during the descent varied between 28 and 42 km/h with the use of maintained light brake applications and with the locomotives' dynamic brakes.

Two train and engine crews handled the long train between Itabira and Vitória. Each engine crew had two enginemen, both qualified as drivers, who alternated at the controls. Each train crew consisted of one conductor and one brakeman, both riding at the rear of the train.

On this particular run an observation car replaced the caboose at the rear of the train. For future service, however, a number of regular cabooses are under construction by Fábrica Nacional de Vagões. These crew cars will have standard caboose brake equipment (air gauge and A-2 caboose valve). VHF radio equipment will be provided for communication with the locomotive.

The ore cars in use on the Vitória-Minas meter-gauge railway are rugged and light weight. Designed and built in Brazil by Santa Matilde and Cobrasma, the cars have the following chief characteristics:

Capacity: 25 cu m, 72 metric tons of ore
Light weight: 18 tons
Length between couplers: 9.70 m
Couplers: Automatic, type F, interlocking (National Castings Co.)
Bogies: Cast steel. Ride Control type, locally built; 15.24-cm × 27.94-cm axle boxes; roller bearings; 83.82-cm wheels, type CR, multiple wear.
Brakes: ABEL. 19.367 cm × 30.48 cm empty load with manual change over. Built by Freios e Sinais do Brazil S.A., under Westinghouse Air Brake Co. license.

A total of 160 of the above cars are equipped with SKF axle boxes with two-row spherangular roller bearings. Another 250 cars now under construction will have Timken "All-Purpose" roller bearings. Some of the new cars may be equipped with Alliance heavy-duty couplers with interlock wings (made locally by Cobrasma) or the National AP interlock type (produced in Brazil by Aços Paulista).

The Vitória-Minas Railway uses 55.94 kg/m rail, and track is maintained to high standards. The 2% descending grades are to be replaced soon by 1.5% (uncompensated). This is, of course, uphill in the empty direction. The maximum grade in the loaded direction is 0.5%.

In addition to the frequent ore trains, the railway also operates two passenger trains daily in each direction, and other trains are handled locally—averaging 15 trains a day in both directions apart from the ore movement. The railway handles about 1.5 million tons of merchandise traffic annually, as well as a considerable volume of livestock.

### Train à Minerai Brésilien

**Depuis presque trois ans des essais ont été effectués sur la ligne Vitoria-Minas au Brésil pour déterminer les méthodes au plus grand rendement pour le transport en masse de minerai de fer.**

### Brasilien: Erzbeförderung

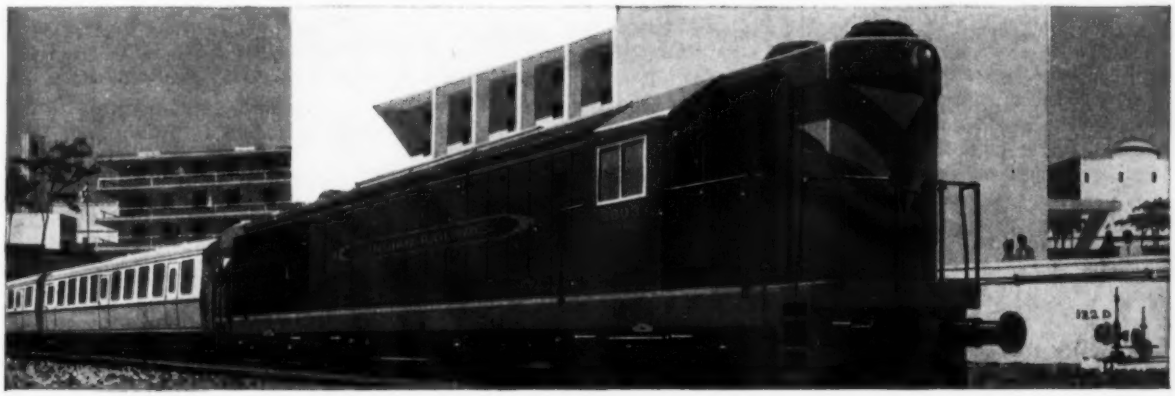
**Die Ausführung einer Reihe von Experimenten, die vor ungefähr drei Jahren begann, wurde jetzt der Vitorias-Minas-Bahn, Brasilien, übertragen, um die zweckmässigsten Methoden für umfangreiche Eisenerzbeförderungen zu ermitteln.**

### Tren de mineral brasileño

**En el ferrocarril Vitoria-Minas en el Brasil se han hecho una serie de experimentos para establecer los métodos mas eficientes para la trasportación de mineral de hierro.**

*Indian Railways purchase 70*

# GENERAL MOTORS LOCOMOTIVES



Deliveries will begin this year on the first General Motors Diesel-Electric locomotives to go to India—70 units built to meet Indian Railway specifications.

Forty Model GT16, 2,600/2,400 h.p., broad-gauge locomotives have been ordered for the Northern Railway. Largest, most powerful General Motors locomotives ever offered overseas, these units will be based at Moghal Sarai and will be used in time freight operations hauling heavy goods trains.

Thirty Model GA12 meter-gauge locomotives will be delivered to the North-east Frontier Railway and will be maintained at Siliguri. These 1,240/1,150 h.p. locomotives, rated to insure 1,150 h.p. under site conditions for tractive purpose, will also be used to handle increasing goods traffic. Equipped with 1-B-B-1 wheel arrangement, they have a 12-ton axle load and will provide excellent riding characteristics as well as reduced rail stresses with less rail and flange wear.

Addition of India to our honour roll of customers brings the number of countries where General Motors locomotives operate to a total of 38. Throughout the world GM locomotives have established unparalleled records for high tonnage operation at lowest cost. Whether the need is for one locomotive or a fleet, railways can count upon the complete co-operation of the world's most experienced builder of Diesel motive power. Your inquiry will receive prompt attention.

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**LOCOMOTIVE PLANTS:** Electro-Motive Division of General Motors, La Grange, Illinois, U. S. A. General Motors Diesel Limited, London, Ontario, Canada

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GENERAL MOTORS LOCOMOTIVES

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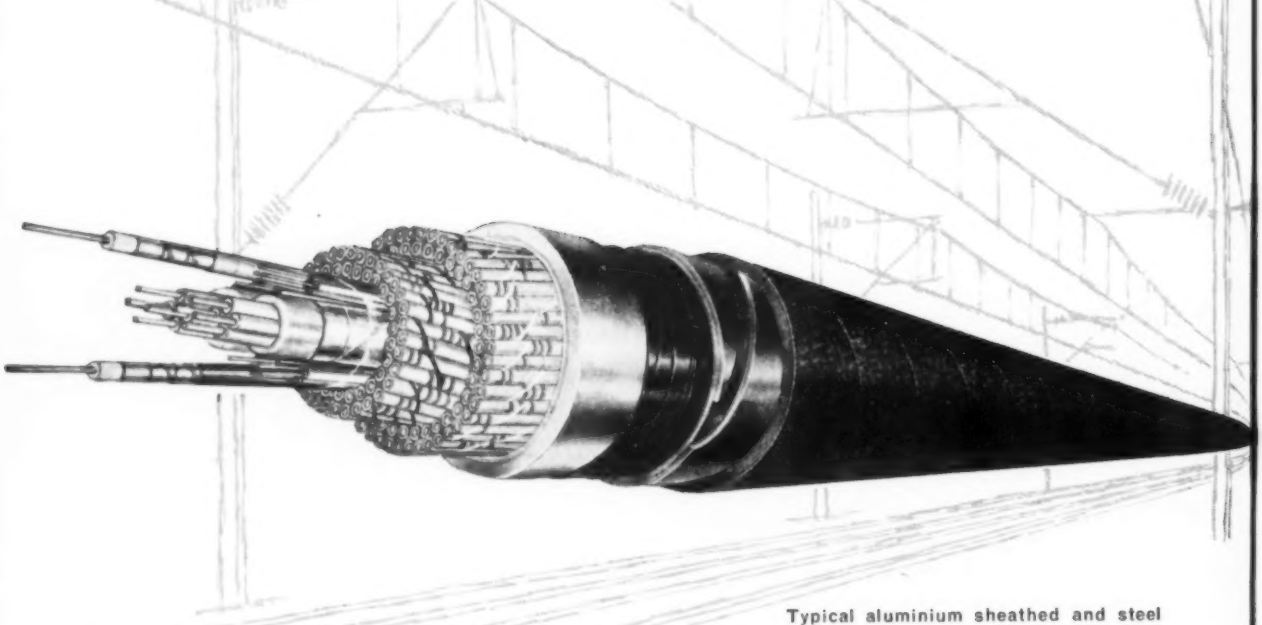
BICC are specialists in the design of screened cable systems for use in the difficult induction environment of A.C. electrification. Modern railway communications demand increasing bandwidth for long distance circuits—BICC small diameter coaxial pairs meet this demand. Detailed information is available on request. Publication 437 describes BICC standard screening designs and their applications. Publication 422 gives details of small diameter coaxial cable designs including composite types.



Typical aluminium sheathed and steel screened composite cable incorporating small diameter coaxial pairs.

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**21 Bloomsbury Street, London, W.C.1, England**

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First small scale storage facilities at Chicago realized big operating savings for the Pennsylvania Railroad

# Pennsylvania Railroad Cuts Fuel Costs

**The Pennsylvania Railroad, largest US railway, has undertaken a program which it believes will reduce substantially the annual costs of diesel fuel. The railway has now completed a $2,700,000 construction program during which it installed fuel storage and distribution facilities at four important locations—Philadelphia, Pittsburgh, Pennsylvania; Cincinnati, Ohio; and East St. Louis, Illinois.**

Objective of the program is to provide sufficient capacity so the railway can purchase and store its diesel fuel at times when prices are most favorable. An average lower cost of only $0.0001 per 3.78 litres can mean a saving to the Pennsylvania of $25,000 annually. The railway uses nearly 946 million litres of diesel fuel per year.

Diesel fuel costs to US railways do fluctuate, particularly in the cold-weather months when home heating-needs compete for available oil supplies. According to G. E. Hargreaves, fuel purchasing agent of the Pennsylvania Railroad, diesel fuel prices can vary as much as $0.02 per 3.78 litres during the winter.

Thus the railway decided to install sufficient storage capacity to permit large fuel purchases during periods when low prices generally occur. The three new storage tanks at Philadelphia have a combined capacity of 68,243,000 litres; three tanks at Pittsburgh (Conway marshalling yard) hold 37,853,000 litres; four tanks at Cincinnati hold 56,780,000 litres and two tanks at East St. Louis hold 30,281,000 litres.

The decision to install the four fuel terminals actually goes back several years, to 1952. In that year the Pennsylvania undertook a storage program on a small scale at Chicago, Illinois. Two tanks, with combined capacity of almost 18,926,000 litres, were placed in service. The carrier soon began to realize important savings from the Chicago facility and made plans to expand to other cities.

Based on the showing made by the Chicago terminal, the railway expects it will be able to amortize the new investment in storage facilities and realize substantial operating savings "in a relatively short period of time."

The facilities will, in any case, permit the railway to accept delivery of fuel in volume. From these points, the oil can be distributed over wide areas as needed. The railway already maintains an extensive distribution network for this purpose, consisting of almost 300 leased tank cars, transport and special fueling trucks.

At many consuming points where locomotives are re-fueled, the railway has also installed automatic shut-off nozzles on fueling hoses. The purpose here is to reduce spillage and thereby remove a safety hazard as well. The special nozzles are similar to the devices widely used in petrol stations. Once the fuel level inside the vehicle tank reaches a predetermined level, the flow of fuel into the tank is stopped automatically.

Another facet of the Pennsylvania's system-wide interest in diesel fuel is the railway's Test Department at Altoona, Pennsylvania.

The test engineers at Altoona set quality standards for fuel used by all PRR locomotives, and all shipments to the railway are analyzed to make sure they meet established standards.

As a further check, test inspectors at Altoona obtain samples periodically from storage tanks.

### Diminution des frais de carburant aux Etats-Unis

**La plus grande entreprise de chemin de fer d'Amérique, le Pennsylvania Railroad, a entrepris d'abaisser considérablement ses frais annuels d'huile diesel. Elle vient d'achever, pour 2.700.000 dollars, une étape de travaux qui comprenait l'aménagement de quatre nouvelles installations de stockage et de distribution du carburant.**

### Senkung der Treibstoffkosten

**Das grösste Eisenbahnunternehmen Amerikas, die Pennsylvania Railroad, hat ein Programm in Angriff genommen, dessen Verwirklichung die jährlichen Aufwendungen für Dieseltreibstoff wesentlich herabsetzen soll. Zu der mit einem Kostenaufwand von $2.700.000 ausgeführten und soeben beendigten Bauetappe gehörte die Installation von vier neuen Anlagen für die Lagerung und Verteilung von Dieseltreibstoff.**

### Gastos de Combustible reducidos en EE.UU.

**El Pennsylvania Railroad, el ferrocarril más grande en EE.UU., está realizando un programa que tiende a reducir considerablemente los gastos anuales de combustible diesel. Se ha terminado un programa de construcción de $2.700.000 y se han ejecutado instalaciones de almacenaje y distribución de combustible en cuatro localidades.**

# Tasmania Starts Searail Service

**The introduction in 1959 of a "roll-on, roll-off" ferry service across the 370-km (230 miles) Bass Strait separating Tasmania from the Australian mainland caused a major revolution in the former traffic patterns of the Tasmanian Government Railways. In place of a completely isolated network serving Australia's island state, whose only contact with the mainland was by sea and air, the ferry service now provides, in effect, a floating bridge for road transport carrying merchandise to and from the other States, unhindered by legislative control.**

**This could have drawn much potential traffic from the TGR thereby draining the lifeblood from a system which depends almost entirely on freight for its revenue.**

**This situation, however, did not arise, thanks to the vision and forward planning of the TGR administration who foresaw the vast alterations which the ferry service would make to all transport operations in Tasmania. The former general manager, Mr. C. G. C. Wayne (now Commissioner of the Western Australian Government Railways) was deputed to conduct an investigation into the affect that the new cross-strait link would have and how the additional business so generated could be co-ordinated with existing rail operations.**

In addition to initiating a combined road-rail interstate freight service using the overnight ferry and providing door-to-door movement between Tasmania and Melbourne or other capital cities, the TGR introduced two types of special purpose rail vehicles and an open container, all designed to take advantage of the many unusual factors of the Tasmania-mainland traffic.

The success of these ventures has been reflected in strengthened finances, and the introduction of additional "roll-on, roll-off" and container-carrying vessels in conjunction with MV Princess of Tasmania must obviously snowball this improvement.

The second ferry, MV Bass Trader, entered service in April this year and caters for road vehicles and containerized freight exclusively. It operates between Melbourne and three Tasmanian ports—Burnie, Bell Bay (Launceston) and Devonport—making three return trips weekly.

The Government-owned Australian National Line, operators of the Princess of Tasmania and the Bass Trader, are also contemplating the construction of a third ferry to carry freight, road vehicles and passengers between Sydney and Hobart.

The ANL has also converted another vessel, for specialized freight on the Tasmanian service. This ship is being used for the carriage of timber in unit loads and containers between Melbourne, Stanley and Launceston. The existing deck gear has been replaced by three cranes each capable of lifting 15 tons and moving platforms are being installed in the holds.

By means of specially designed "bridles," packs of timber and other unit loads weighing up to six tons and containers up to a gross weight of 14 tons are lowered by the ship's cranes onto the platforms which then move over to the wings of the hold allowing the space in the square of the hatch to be loaded. It is believed that this ship is the first vessel of this type in the world. Her cargo handling facilities differ from those on the other ferry vessels mentioned which load through watertight doors in the stern at specially constructed docks.

The addition of these vessels in the Tasmanian trade with their road vehicle and container ladings has meant that new thinking and a new approach to freight operations were necessary if the TGR was to survive this onslaught of competition and receive its share of the business.

The system is now fully geared to meet the requirements of these new services and the method of handling ferry cargo in specially designed open containers (aptly named Railroaders) has introduced a feature unique in Australian railway practice.

Its speed, convenience, efficiency and economy have struck at the very vitals of conventional shipping and land handling which had formerly been the only avenue for bulk movement to and from the island of Tasmania.

The containers used by the TGR in their "Searail" service, as the rail-ferry co-ordination is titled, are of pallet-like design. They are 4.3 m long, 2.3 m wide with removable sides, 1.22 m high and ends 1.4 m high.

They are sturdily built and have a load capacity of 10 tons in weight or 14 tons cubic. Loading is protected by neoprene fabric tarpaulins, under which, if the contents demands, are placed insulating blankets.

The containers can be carried on road or rail vehicles with equal facility and can be handled on or off vehicles by fork lift, crane or gantry. The success of these units is indicated by the prime condition in which frozen pork and apples arrive in Sydney after three- and four-day journeys by rail, road and sea from inland Tasmania.

Inherent advantage of the containers is their ability to load to different heights according to density, as the ferry component of the door-to-door "Searail" service charges is on a basis of square feet of deck space occupied with rates varying according to the height of the load.

For a box container, the charge would be constant, irrespective of volume of contents, and therefore unless fully loaded uneconomic in comparison. Moreover, Railroader pallets can be nested for

Introduction of the Bass Strait ferry service and the movement of the larger containers as used on the mainland systems necessitated the construction of bogie flatcars with reduced loading height, only 162 cm above the rail level

The containers used by TGR in its Searail service are of pallet-like design, measuring 4.3 m long, 2.3 m wide, with removable sides, 1.22 m high and ends, 1.4 m high. Protection is provided by neoprene tarpaulins and insulated rugs

empty return should unbalanced loading occur.

On the mainland, the Railroaders are carried interstate by rail and delivered to and from railheads by accredited carriers who are agents of the TGR for this service. The catholicity of the Railroaders in respect of suitable lading is shown in the following list of merchandise which has already been carried in this manner. These include confectionery, fruit (apples – fresh and chilled), potatoes, frozen meat, seasoned and dressed timber in packs, plywood, electrodes, tinned preserves and hides.

The introduction of the Bass Strait ferry service and the movement of the larger containers as used on the mainland systems necessitated the construction of bogie flatcars with reduced loading height. Use of a 152-cm diameter wheel has brought the platform level of these vehicles to 162 cm above the rail. Special flatcars have also been built for the transport of private cars and other road vehicles.

TGR initiated a combined road-rail interstate freight service using the overnight ferry, MV Princess of Tasmania, and now provides door-to-door movement between Tasmania and Melbourne or other capital cities across the Bass Strait

## Transformation radicale des transports de marchandises en Tasmanie

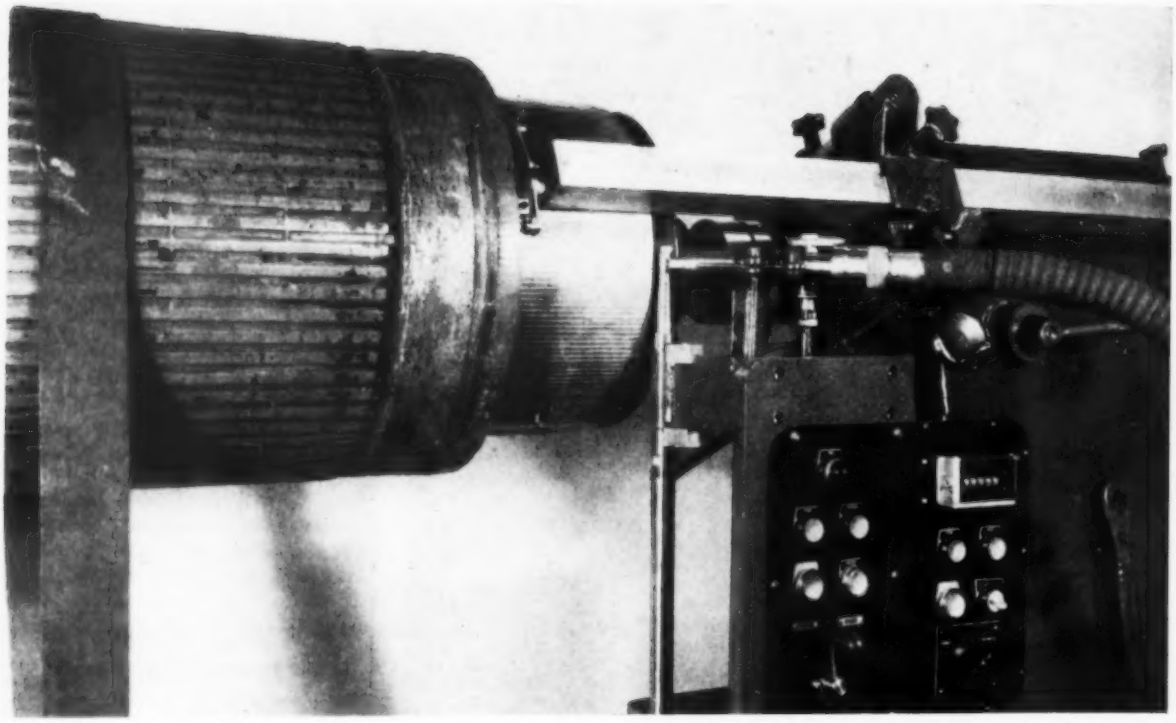
**Le service de ferry-boats introduit en 1959 dans le détroit de Bass, entre l'Australie et la Tasmanie, sur une distance de 370 km, a radicalement modifié les transports de marchandises des Chemins de fer gouvernementaux tasmaniens (TGR). Après avoir mis sur pied un service des marchandises rail-route utilisant le ferry-boat de nuit, les TGR ont lancé deux types de wagons spéciaux et des containers ouverts, qui tiennent avantageusement compte des conditions très particulières du trafic interne de Tasmanie. La conséquence en a été une amélioration de leur situation financière.**

## Revolution in Tasmaniens Güterverkehrsabwicklung

**Der im Jahre 1959 eingeführte Fährebootdienst quer durch die 370 km weite Bassstrasse zwischen Australien und Tasmanien hat die Abwicklung des Güterverkehrs der Tasmanian Government Railways (TGR) grundlegend verändert. Nebst der Eröffnung eines interstaatlichen Schiene-Strasse-Güterdienstes, der das Nachtfähreboot benützt, hat die TGR zwei Typen besonderer Spezialwagen und offene Behälter eingeführt, die den aussergewöhnlichen Verhältnissen in Tasmaniens Binnenverkehr vorteilhaft gerecht werden. Der Erfolg dieser Massnahmen ist in einer verbesserten Finanzlage zum Ausdruck gekommen.**

## Revolución en las operaciones de carga de Tasmania

**La introducción en 1959 de un servicio ferrobarco a través del Estrecho Bass (370 km), que separa Tasmania del continente australiano, ha producido una revolución en el tráfico de los FF.CC. tasmanios. Además de introducir un servicio ferro-camión que utiliza el ferrobarco de noche, los TGR han introducido dos tipos de vehículos especiales y un contáiner abierto, diseñados para aprovecharse de los factores poco usuales del tráfico en Tasmania. El éxito de estas empresas se refleja en un aumento de los ingresos.**



Saw carriage on the Peerless DS commutator undercutter ready to begin work; eliminates slow manual operation

# Undercutting Commutators

### Fraisage automatique de collecteurs

**L'"Illinois Central Railroad" a introduit le fraisage automatique des collecteurs d'armatures de moteur et de génératrice dans ses ateliers de traction diesel. Il en résulte un précieux gain de temps sur le travail à la main.**

### Automatisierte Kollektorenfräsung

**Die Illinois Central Railroad hat in ihren Dieselwerkstätten die Ausfräsung der Kollektoren von Motor- und Generatorarmaturen automatisiert, wodurch zeitraubende Handarbeit ausgeschieden wird.**

### Automación del fresar de colectores

**Los talleres diesel del Illinois Central Railroad en EE.UU. han instalado la automación del corte de colectores de los inducidos de motores y generadores. La nueva máquina ha eliminado la lenta operación manual.**

**The Illinois Central Railroad diesel shops at Paducah, US., have "automated" the work of undercutting commutators on motor and generator armatures.**

**A new automatic machine—the Peerless DS undercutter—has been installed. Use of the machine has eliminated a slow manual operation and the railway has reduced the time for undercutting main generator commutators from approximately 16 hours to around 2 hours.**

According to supervisors at the shop, undercutting a traction motor commutator formerly required 8 hours. A similar job can now be accomplished in less than one hour.

The quality and uniformity of work has been improved, too. For example, damage resulting from incorrect tool handling, or other mistakes by workmen, have been virtually eliminated.

With the new equipment the railway has obtained production of five commutators per day. On this basis, the new automatic machine is expected to pay for itself in less than two years.

This is how the new machine works:

After the armature is placed in the machine, an air cylinder moves the saw carriage along the bed. Forward movement is controlled by push button; a micro-switch controls reverse movement. A reverse push button is provided to set the required length of travel for the carriage in the event the reversing micro-switch should fail.

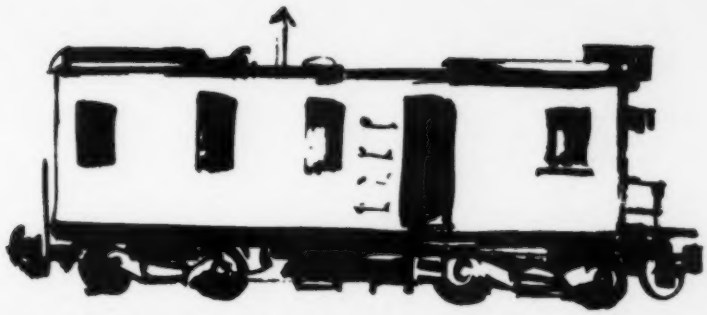
A $^1/_2$-hp motor, and the saw spindle, is assembled on the saw carriage, along with mechanical drives for positioning the cutting saw on the commutator.

Two circular saws in the spindle permit two adjacent slots to be undercut simultaneously. The saw motor is started and stopped by push button, and a pilot light indicates when the saws are revolving.

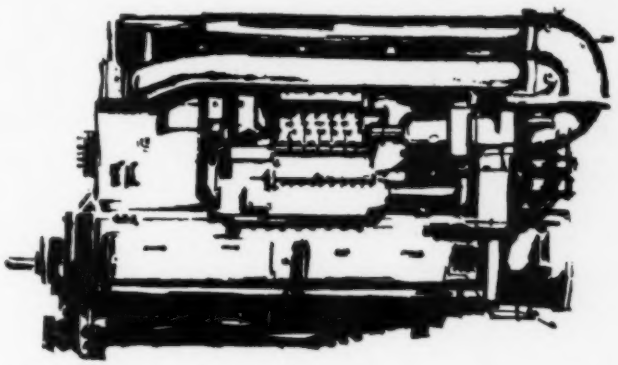
A hydro-check in the tailstock of the machine works with the air cylinder to provide a smooth feeding rate. When a saw blade contacts a hard section of mica, the hydro-check retards the rate of feed and prevents saws from overheating and losing temper. Adjustable valves on the air cylinder and hydro-check control rate of feed, checking and return.

The armature turning attachment, which is an automatic slot locating device, is positioned at the headstock of the bed. The attachment rotates the armature by a forward and reverse drum switch.

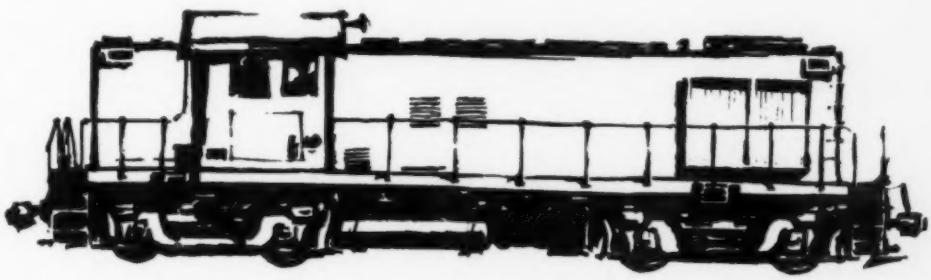
The Peerless machine will support armatures having a maximum diameter of 152.4 cm, with a shaft length of 182.88 cm and a maximum weight of 4082 kg. Commutators of 15.24- to 106.68-cm diameter, with a maximum face of 45.72 cm can be cut.



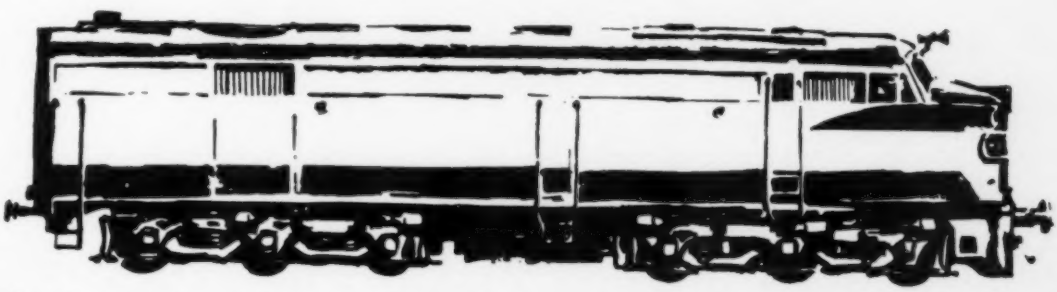
**The company that built the first commercially successful diesel electric**



**The first turbocharged railway diesel engine**



**The first all-purpose type locomotive**



**The first standard streamlined locomotive for restricted clearances**

**NOW BRINGS YOU...**

# A new series of high-horsepower, single-engine locomotives for world-wide conditions

Continuing advances in ALCO's development of turbocharged diesel engines with high mean effective pressures has made possible a new series of locomotives suited to world-wide conditions. They include DL-535, 1350/1200 hp, extremely reduced clearances, 11.25 metric tons per axle; DL-543, 2150/2000 hp, restricted clearances, 16 metric tons per axle; and DL-560, 2600/2400 hp, for very heavy-duty service. In addition, nine other standard ALCO locomotives, from 975 to 2600 bhp, with high and low axle loads, are available.

ALCO **PRODUCT QUALITY COMES FIRST**

NOV

# This past year...
## railways on 5 continents again chose ALCO locomotives

**The efficiency and high quality of ALCO locomotives has led to their choice in the past year by railways in Europe, Asia, North America, South America and Australia. Excluding those in Canada and the U. S., there are now more than 2 million ALCO horsepower in service around the world. ALCO offers more locomotive models, in a wider range of horsepower rating, than ever before.**

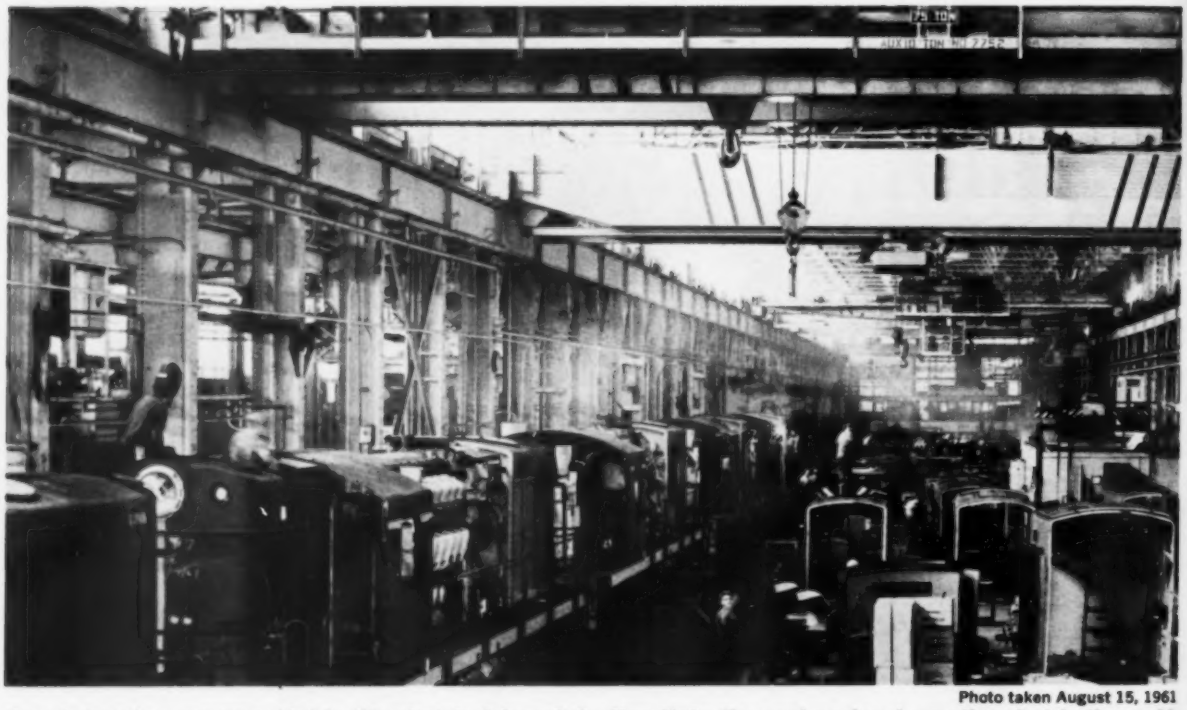


Photo taken August 15, 1961

**ALCO locomotives are assembled in this plant in Schenectady, New York—the most modern locomotive plant in the world.**

**ALCO's Australian Licensee A. E. Goodwin Ltd. is producing a sizeable order of DL-531 locomotives for the New South Wales Government Railways.**

*For more information, write:* **ALCO PRODUCTS, INC.**, 530 FIFTH AVE., NEW YORK 36, N.Y., U. S. A. (CABLE ADDRESS: LOCOMOTIVE, N.Y.) or contact any of the following foreign associates and licensees: **ALCO PRODUCTS EXPORT CO., INC.**, 8 GRAFTON ST., LONDON; **MONTREAL LOCOMOTIVE WORKS, LTD.**, BOX 1000, PLACE D'ARMES, MONTREAL; **ASSOCIATED ELECTRICAL INDUSTRIES**, TRAFFORD PARK, MANCHESTER, ENGLAND; **A. E. GOODWIN LTD.**, 315 PARRAMATTA RD., AUBURN, N. S. W., AUSTRALIA; **DAVEY, PAXMAN & CO., LTD.**, COLCHESTER, ENGLAND; **CIA EUSKALDUNA**, CASTELLANA 1, MADRID. Agents throughout the world.

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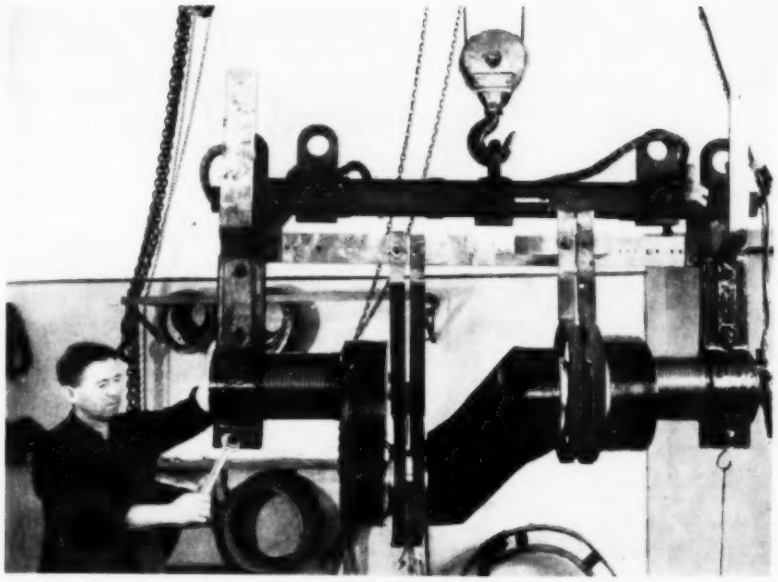


Crank axle of a four cylinder locomotive with plating racks and anodes

# German Chrome Experiments

**The wear of engine parts can be decreased or even neutralized by several methods. Of these, hard-chromium-plating offers some important advantages—extreme hardness; exceptional wear resistance and good corrosion resistance. For these reasons the method has been widely introduced in European and US overhaul departments.**

Deutsche Bundesbahn has recently installed a series of self-regulating high-speed baths and experiments have shown that the resulting current efficiency is higher than that achieved by orthodox methods.

The layer thickness of several engine parts and the bath times of each were measured, partly in orthodox baths and partly in SRHS baths. Fig. 1 shows the results of these measurements.

Because of the shorter bath-time required for the SRHS method the baths have proved of economical advantage despite the higher cost of electrolytes. In addition, the quality of chromium plating has been very good.

Results of some of DB's experiments into the field of chrome plating are given below: —

• A number of worn crankshafts were salvaged and cost of repair came to only 4% of possible replacement cost. The resulting bond between the chromium layer and base material was excellent and remained until the layer had been worn through.

• It was found that the working lifetime of connecting rods could be lengthened by plating the inside of the heads with about 200 mu of chromium plating.

• Wear and corrosion of flexible couplings decreased considerably when the coupling joints were plated with 50 mu of chromium. The couplings remained tight for longer and overhaul costs decreased by 20%.

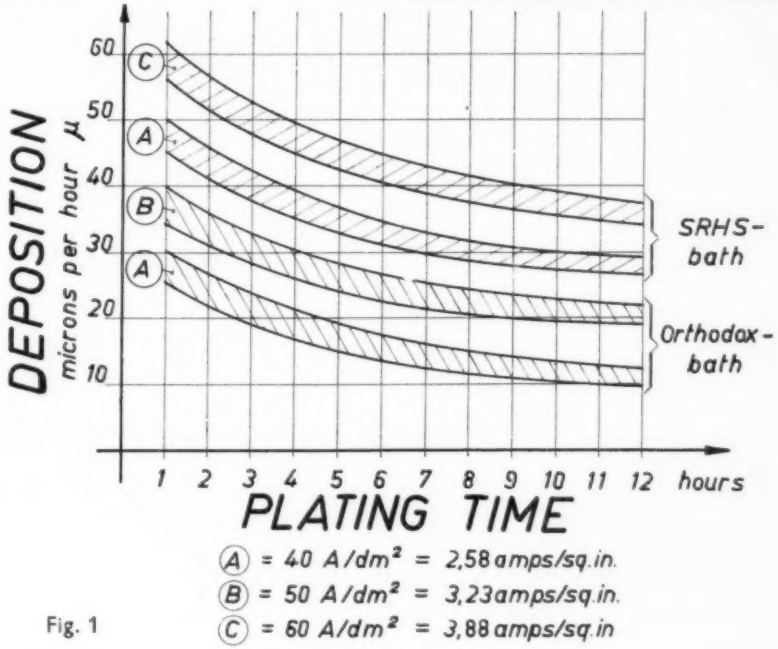



Fig. 1

### Chromage Dur

**Parmi les procédés de durcissement des surfaces ou de remplacement de matériaux usés, le chromage dur occupe une place toute particulière. Il la doit à la très grande résistance à l'usure qu'offre le chrome en soi et à la possibilité de procéder à des rechromages à des températures peu élevées. Avec ses multiples possibilités d'application, ce procédé offre des avantages notables du point de vue financier, aussi dans le domaine de l'entretien des véhicules du chemin de fer.**

### Hartverchromung

**Die Hartverchromung nimmt unter den Fertigungsverfahren zur Oberflächenhärtung oder zum Ersetzen abgenutzten Werkstoffe eine besondere Stellung ein. Dies ist bedingt durch die höhere Verschleissfestigkeit von Chrom an sich, durch das die Form und das Gefüge sehr schonende Fertigungsverfahren und durch die mehrmalige Wiederholbarkeit der Hartverchromung unter Anwendung niederer Temperaturen.**

### Cromado Duro

**El cromado duro se destaca en alto grado de los diferentes procesos empleados para endurecer y renovar materiales usados. Es debido a la mayor resistencia del cromo al desgaste y porque el cromado se puede repetir algunas veces a temperaturas bajas. Este proceso ofrece economías considerables también para diferentes reparaciones del material móvil.**

# Argentina: The Long Road Back

**At the height of Argentina's protracted railway crisis (p. 42, IRJ, Aug./Sept.), President Frondizi appointed Arturo Acevedo as Minister of Public Works and armed him with special powers. Below is a special report from Buenos Aires on the steps Acevedo has taken and the many problems he still faces in curing the economic ills of Argentina's 44,500-km railway system.**

When Dr. Arturo Frondizi was installed as president of Argentina, he found his country on the verge of bankruptcy. With the Argentine treasury virtually empty, Frondizi promptly introduced a long-range stabilization and development program.

The program consisted of two main chapters: (1) National Petroleum Development and (2) Transportation overhaul. Tackling of the first soon halted the drain on Argentina's dwindling foreign exchange reserves resulting from the importation of oil. This was largely accomplished through aggressive measures, which allowed foreign oil companies to participate in the development of national petroleum resources.

Just as essential to the success of Frondizi's economic program—and vastly more difficult—is the overhaul of Argentina's rundown rail system whose losses now account for some 25% of the country's total budget. The railway deficit, according to official estimates, will be running at an annual rate of 23 billion pesos ($281 million US) by the end of this year. Actual losses to the economy are much higher. Delayed deliveries resulting from the worn-out rail network have cost the country millions of pesos in perishable goods alone.

Faced with this situation, Frondizi turned to Arturo Acevedo, a hard-boiled industrialist with a reputation for getting things done. Acevedo agreed to accept the post of Minister of Public Works only on the condition that he be given the necessary powers to deal with the transportation crisis. Frondizi agreed, and promptly issued special decree No. 4061/61 which gives Acevedo extensive authority.

Acevedo assumed his present responsibilities this past May and immediately put into motion an emergency plan to eliminate the chronic ills that prevent economic operation of the railways. His first move was to freeze certain major expenditures in an effort to halt the spiraling deficit. Since then he has issued a number of decrees that add up to a promising start in curing Argentina's transportation ills.

As a first move to trim personnel from the over-staffed railways, Acevedo ordered immediate retirement for every employee who has reached 55 years of age. This will reduce active staff by an estimated 16,000 employees.

Acevedo has also earmarked 4000 km of old and unused track for abandonment—a move that will represent a very substantial economy. In addition he has marked 350 level crossings in the city of Buenos Aires for elimination or replacement with automatic installations.

A major feature of Acevedo's program is the transfer of as many auxiliary services as possible—all of which are now being operated by the railways at huge losses—to private concerns. Villalonga-Furlong, the large railroad-owned organization in charge of loading and unloading freight and delivery services, will be offered for sale soon.

Under a recent tender to place the restaurants in rail terminals in the hands of private operators, the highest bid reached $250,000 (US). This figure, which would be all profit for the railways, amounts to half the present loss on the same service. Railway employees, who only recently staged a long strike against this measure, are given an equal change to compete for this business.

These and other measures Acevedo is introducing are expected to trim the present deficit by some $100 million, provided he can get by two other major hurdles: obsolete equipment and recalcitrant labor unions.

Argentina's six railways are operating with equipment and material so obsolete and badly serviced that much of the rolling stock is beyond maintenance. Traction, as the table on page 38 shows, is the most appalling aspect of this situation.

Of the existing total inventory of 3503 steam locomotives, roughly 60% stand idle and are out of service, either because their operational life has been exceeded, or because of inadequate maintenance. A similar situation applies to 25% of the current roster of diesel-electric locomo-

Public Works Minister Arturo Acevedo

tives. The number of serviceable diesel electrics will be even further reduced with the withdrawal by the end of this year of another 115 units which have reached their maximum operational mileage.

The motive power situation is worsened by the acute shortage of shunting locomotives—a condition which has made it necessary to use main-line units to fill the gap.

Workshops are unable to keep pace with the ever increasing volume of overhauls and repairs because of obsolete maintenance facilities and the shortage of skilled technicians. Until recently, private companies were contracted to help repair steam locomotives, but political pressure forced the railway administration to discontinue this practice. The upshot is that an increasing number of units remain paralyzed in the yards.

Other problems facing Acevedo lie in the obsolete condition of the country's 84,000 freight cars and 4400 passenger cars, an outdated signaling system and the poor condition of most of the country's trackage.

Labor, in recent months, has come to constitute Acevedo's biggest headache, although it has long hovered as a serious obstruction to any fast improvement of service, and a much needed drastic reduction of the terrific deficit. Out of the 210,000 workers presently employed, the government says that over 75,000 are unnecessary and should be wiped off the payrolls. The mere thought of this is stubbornly resisted by the country's two railway unions.

## Reprise économique des Chemins de fer d'Argentine

**Lorsque la crise persistante des Chemins de fer d'Argentine atteignit son point culminant (cf. p. 42, IRJ, août-septembre), le président Frondizi nomma un nouveau ministre des travaux publics avec mission de se rendre maître de la situation. Le présent article est un rapport spécial de Buenos Aires sur les mesures prises par le ministre Acevedo et les difficultés à surmonter pour assainir la situation économique des Chemins de fer d'Argentine, dont le réseau compte 44,500 km de lignes. Depuis son entrée en fonction en mai 1961, Acevedo a pris diverses décisions pour réduire le personnel, abandonner 4,000 km de lignes sans affectation et transférer à l'économie privée des entreprises auxiliaires travaillant avec de gros déficits. Le programme d'Acevedo doit permettre d'abaisser de cent millions de dollars le déficit des chemins de fer, qui est actuellement de 281 millions de dollars (23 milliards de pesos). Cet objectif ne peut être atteint que si deux des grands problèmes qui se posent peuvent être résolus. Le premier, c'est la résistance des syndicats argentins, qui s'opposent à la réduction du personnel voulue par le gouvernement; le second, c'est le vieillissement du matériel roulant aujourd'hui en service sur les chemins de fer. La grande pénurie de véhicules moteurs se fait aussi particulièrement sentir.**

## Die wirtschaftliche Erholung der Argentinischen Eisenbahnen beginnt

**Als die andauernde Krise der Argentinischen Eisenbahnen ihren Höhepunkt erreichte (S. 42, IRJ, Aug.-Sept.), ernannte Präsident Frondizi einen neuen Minister für Öffentliche Arbeiten, Arturo Acevedo, um dem Zustand Herr zu werden. Vorliegender Artikel ist ein Sonderbericht aus Buenos Aires über die von Acevedo getroffenen Massnahmen und die Schwierigkeiten, die zu überwinden sind, um die wirtschaftliche Lage des 44,500 km umfassenden Eisenbahnnetzes Argentiniens zu sanieren. Seit seiner Amtsübernahme, im Mai 1961, hat Acevedo verschiedenes veranlasst, um Personal einzusparen, 4000 km brach liegendes Geleise aufzugeben und Nebenbetriebe, die mit grossen Verlusten arbeiteten, an private Firmen abzutreten. Acevedos Programm soll das gegenwärtige Defizit der Eisenbahnen von 281 Millionen US-Dollars (23 Milliarden Pesos) um 100 Millionen US-Dollars vermindern, was ihm voraussichtlich nur möglich ist, wenn er zwei der hauptsächlichsten Probleme lösen kann. Das erste besteht im Widerstand der argentinischen Gewerkschaften, die sich gegen den Personalabbau der Regierung wehren, und das zweite im veralteten Rollmaterial, mit dem die Eisenbahnen heute den Betrieb aufrecht erhalten müssen. Dabei macht sich auch der grosse Mangel an Betriebfahrzeugen besonders bemerkbar.**

## Comienza el Restablecimiento de los FC de la Argentina

**Al culminar la prolongada crisis ferroviaria de la Argentina (véase pág. 42, IRJ agosto/septiembre), el Presidente Frondizi nombró al Sr. Arturo Acevedo Ministro de Obras Públicas. Este artículo contiene un reportaje especial de Buenos Aires sobre las medidas que el Sr. Acevedo ha tomado y los problemas que enfrenta todavia al sanear el sistema ferrocarrilero de 44.500 km. Desde el mes de mayo de 1961, cuando asumió la responsabilidad, el Sr. Acevedo ha introducido varias medidas para reducir el personal, abandonar, un 4000 km de vía vieja y poco usada y ceder muchos servicios auxiliares—operados por los FC a costa de grandes déficit—a casas privadas. Se espera que el programa reducirá el déficit de los FC, el que se estima a 23 millones de millones de pesos (US $281 millones), en un $100 millones. Esto se puede realizar sin embargo solamente si el Sr. Acevedo puede solucionar dos otros problemas de importancia. Los sindicatos obreros que hacen una resistencia vigorosa a los esfuerzos del Gobierno para reducir el personal del ferrocarril y el material móvil desusado. En particular la escasez de fuerza motriz se hace de sentir.**

Materfer-Fiat motor coaches (above) and new coaches on order from Japan will replace older suburban equipment (below) which is still in operation

This is particularly true of the larger union, "La Unión Ferroviaria," which enlists all employees and workers, excepting locomotive drivers and firemen, who are united in "La Fraternidad" and are somewhat more agreeable in their relations with management. However, the numerical and strategic representation of both unions combined enable them to withstand any government move that will endanger "the social conquests" achieved under the Perón regime. Every official step attempted to reduce personnel is generally followed by strikes ranging from 24 hours to several days.

Under Argentina's labor laws, this chaotic condition is difficult to control, let alone correct. Whenever a worker is suspended or dismissed, a stoppage takes place, regardless of whether or not the reason is justified, and not even those guilty of deliberate damage to railroad property can be punished.

Argentina's railroad labor problem is best exemplified by the stand taken by the restaurant and cafetaria employees of the General San Martin Railway. Following a recent decision that management took to eliminate the high losses of this service by contracting its operation with private restaurateurs, employees walked out on a strike that lasted two months. It was temporarily ended with the appointment of a special committee to study, once again, the problem of the services' heavy losses. Meanwhile, the strikers received full pay for the days that they were idle.

In many areas of railroad operations, the real causes for losses are difficult, if not impossible, to trace. For instance, railroads offer no accounting for services in dining cars. Unlike most countries, in Argentina the law establishes that mail must be transported free of charge, along with the Post Office's delivery employees. This is still another costly aspect that is bound to come under fire in the overall picture of the deficitory nightmare.

During the last five years, several major plans have come under study for reorganization and rebuilding of the entire system. But the first serious attempt to actually enforce one is only now being made. Admittedly, however, some substantial progress has been made in the interim, consisting principally in the overseas and local purchase of vital equipment, as follows:

• The first major purchase to emerge from these earlier measures, was the signing of a contract, in 1958, for the delivery of 280 diesel-electric locomotives from GAIA. This is an industrial company formed by Ansaldo San Giorgio, Breda, C.G.E., Ercolle Marelli, Oficina Mecaniche Ferroviarie Pistoiesi, all of Italy, and Cometarsa of Argentina.

The 280 units will be delivered in lots stretching from 1963 to 1968. The first 80 will be totally imported, whereas the remaining 200 will be produced in Argentina. While both imported and local components will be used, an increasing share of Argentina parts will go into the locomotives as local production becomes self-sufficient. The factory responsible for this pioneering assignment is Cometarsa in Campana. All units will be equipped with 288-ES Fiat engines, rated 1030 hp, also locally made, and previously purchased by the "Empresa de Ferrocarriles del Estado," the state railway administration.

• As part of a program for replacing steam locomotives, 500 motor coaches were purchased to serve zones where the density of traffic is adequate for this type of unit. An order for 170 of these coaches was awarded to GANZ of Hungary. This manufacturer has already delivered 50 units, and will complete the balance by the middle of 1963. The remaining 330 motor coaches are being built in Argentina by Materfer, an affiliate of the Fiat Group. Sixty are already in operation and the rest will be delivered before the end of 1962.

• Suburban service was reinforced with the purchase of 80 electric motor coaches bought in Japan from the Kawasaki Rolling Stock Co.

• The transportation of oil from the Mendoza oilfields to Buenos Aires is one of the most important operations of the

CONTINUED ON PAGE 38

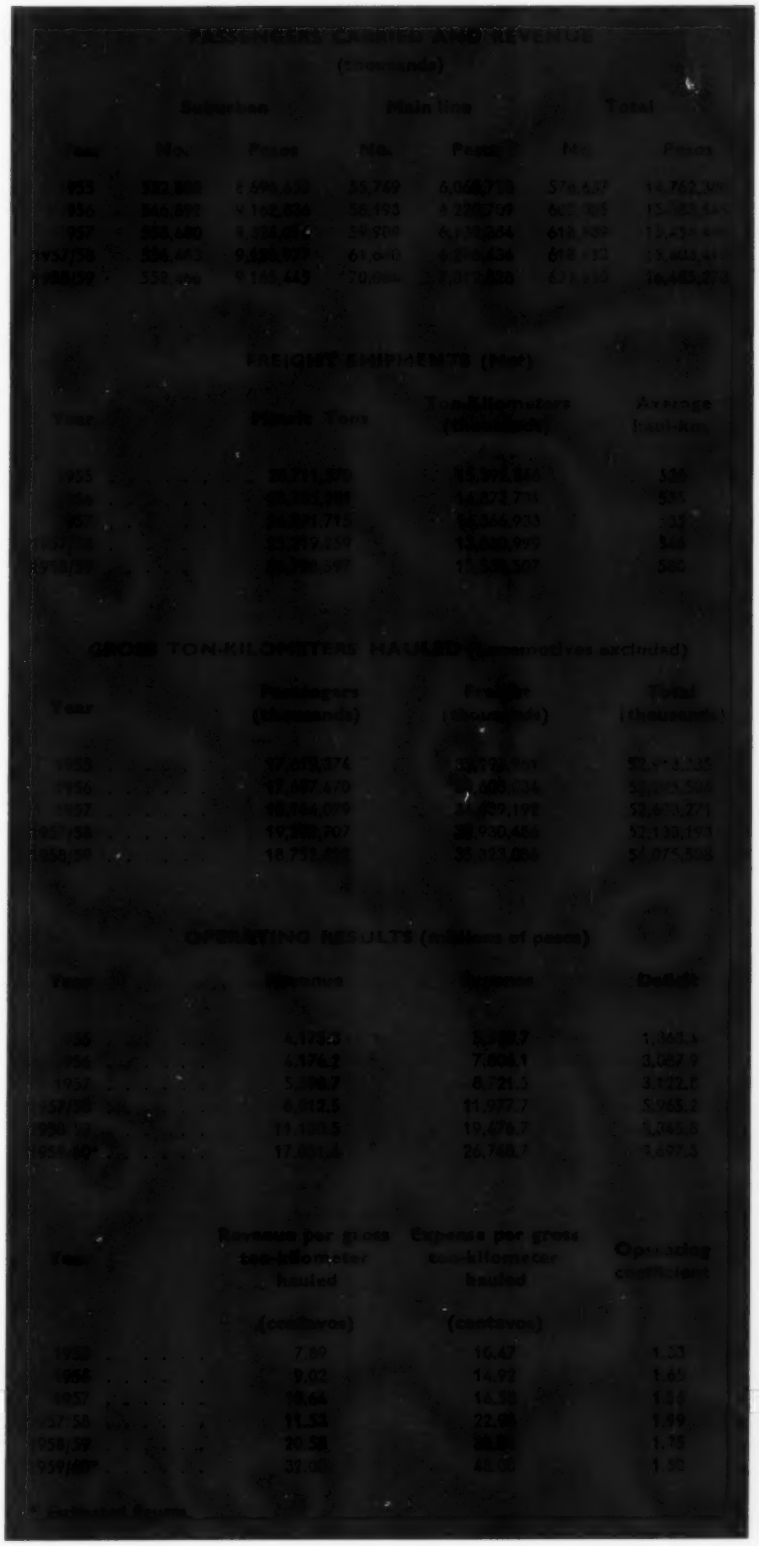
# Argentina Needs Vigor in Management

To achieve rehabilitation, the Argentine railways need a great deal more than extensive purchases of new equipment and other installations to modernize their properties. There are those in a position to know who believe that they need, even more, a parallel improvement on the management side.

The tables on this page clearly reveal that the Argentine railways are not suffering from lack of traffic, or from inroads of competing forms of transportation. The volume of suburban passenger traffic has remained steady and main-line passenger volume has been growing. Ton-kilometers of freight traffic were greater in the latest fiscal year for which figures are available, 1958–59, than in 1955. But the deficit in operating expense in relation to revenue has not been overcome. Indeed, the operating coefficient in the fiscal year 1958–59 was 1.5, compared to 1.33 in 1955. The trouble lies in massive wage increases—along with higher costs of materials and fuel—attendant upon the continued inflation and progressive devaluation of the peso.

Competent observers believe that brisk management control could effect great improvement in traffic handled—possibly as much as 30%, and with little or no increase in operating expenses. A pruning is needed of obsolete stations and closing down of unprofitable lines. Management ought to make it clear that it will not and cannot be held responsible for the losses sustained by these unproductive lines which it wants to shut down. Once such firm measures were applied the real deficit would be revealed and this deficit should be within manageable proportions.

The problem, however, isn't quite that simple. Nobody knows, for example, just how much service the railways should be performing and are not because of current operating difficulties. It will be necessary to get the railways to operating with greater efficiency before the full extent of their financial problem can be disclosed. But a beginning must be made and there are plenty of obvious inefficiencies that afford opportunities.



PASSENGERS CARRIED AND REVENUE
(thousands)

| Year | Suburban No. | Suburban Pesos | Main line No. | Main line Pesos | Total No. | Total Pesos |
|---|---|---|---|---|---|---|
| 1955 | 382,868 | 699,438 | 35,749 | 6,066,710 | 576,437 | 14,762,300 |
| 1956 | 366,892 | 1,162,826 | 38,193 | 7,282,709 | 602,385 | 15,780,444 |
| 1957 | 358,680 | 1,356,681 | 39,909 | 6,170,044 | 618,909 | 13,454,444 |
| 1957/58 | 386,443 | 9,886,979 | 41,040 | 6,814,436 | 618,432 | 13,401,415 |
| 1958/59 | 359,[illegible] | 9,185,449 | [illegible] | 27,072,858 | 621,[illegible] | 16,485,[illegible] |

FREIGHT SHIPMENTS (Net)

| Year | Metric Tons | Ton-Kilometers (thousands) | Average haul-Km. |
|---|---|---|---|
| 1955 | 20,719,870 | 10,592,[illegible] | 520 |
| 1956 | 20,[illegible],[illegible] | 14,[illegible],[illegible] | 535 |
| 1957 | 24,[illegible],[illegible] | 12,[illegible],[illegible] | [illegible] |
| 1957/58 | 22,[illegible],[illegible] | 12,[illegible],[illegible] | 548 |
| 1958/59 | 20,[illegible],[illegible] | 11,[illegible],[illegible] | 580 |

GROSS TON-KILOMETERS HAULED (Commodities excluded)

| Year | Passengers (thousands) | Freight (thousands) | Total (thousands) |
|---|---|---|---|
| 1955 | 17,[illegible],374 | [illegible],[illegible],[illegible] | 52,[illegible],535 |
| 1956 | 17,687,470 | [illegible],[illegible],[illegible] | 52,[illegible],504 |
| 1957 | 18,[illegible],[illegible] | [illegible],[illegible],[illegible] | 52,[illegible],271 |
| 1957/58 | 19,[illegible],707 | 28,[illegible],[illegible] | 52,[illegible],193 |
| 1958/59 | 18,[illegible],[illegible] | 32,[illegible],[illegible] | 51,[illegible],[illegible] |

OPERATING RESULTS (millions of pesos)

| Year | Revenue | Expense | Deficit |
|---|---|---|---|
| 1955 | 4,[illegible].3 | 5,[illegible].7 | 1,[illegible].4 |
| 1956 | 4,[illegible].2 | 7,[illegible].1 | 3,[illegible].9 |
| 1957 | 5,[illegible].7 | 8,721.5 | 3,[illegible].8 |
| 1957/58 | 6,[illegible].5 | 11,[illegible].7 | 5,[illegible].2 |
| 1958/59 | 11,[illegible].5 | 19,[illegible].7 | 8,[illegible].2 |
| 1959/60* | 17,[illegible].4 | 26,[illegible].7 | 9,[illegible].3 |

| Year | Revenue per gross ton-kilometer hauled | Expense per gross ton-kilometer hauled | Operating coefficient |
|---|---|---|---|
| | (centavos) | (centavos) | |
| 1955 | 7.80 | 10.47 | 1.33 |
| 1956 | 9.01 | 14.93 | 1.65 |
| 1957 | 10.44 | 16.58 | 1.58 |
| 1957/58 | 11.51 | 22.00 | 1.91 |
| 1958/59 | 20.58 | 36.82 | 1.78 |
| 1959/60* | 32.00 | 48.00 | 1.50 |

* Estimated figures

**ARGENTINE MOTIVE POWER**

| Age (Years) | Main Line Steam | Main Line Diesel | Shunters Steam | Shunters Diesel | Total Steam & Diesel Steam | Total Steam & Diesel Diesel |
|---|---|---|---|---|---|---|
| 0—17 | 172 | 623 | 10 | 80 | 182 | 703 |
| 17—25 | 150 | — | 62 | — | 212 | — |
| 25—35 | 655 | — | 84 | — | 739 | — |
| 35—45 | 856 | — | — | — | 856 | — |
| over 50 | 1,195 | — | 329 | — | 1,524 | — |
| TOTAL | 3,028 | 623 | 485 | 80 | 3,513 | 703 |

## Argentina: The Long Road Back

CONTINUED

General San Martin Railroad. In 1959, eleven 1800-hp main-line diesel-electric locomotives were incorporated into this service. These units were originally acquired by The Loeb Rhoades Co. for the account of YPF, the state-owned oil company, for whom L and R are extracting petroleum. But this year they were transferred to the San Martin line.

Three very important tenders were opened in November 1960.

• One contemplated the purchase of 100 shunting locomotives, rated around 450 hp. Special consideration was to be given to the proposals offering Argentine production. An idea of the importance attributed to this order is seen by the fact that 45 bidders from all parts of the world submitted quotations. Many of these bidders, themselves manufacturers in different parts of the world also offered to install plants in Argentina, if the order would be ultimately allocated to them.

• Another tender called for the provision of 3000 freight cars. And here again there was great international interest, supported by several proposals, including local manufacture.

• A third tender was for ten 1200-hp main-line diesel-electric units for General Urquiza Railway, Argentina's only standard-gauge (1.435 m) railway.

Since assuming his post in May, Acevedo has moved rapidly to relieve Argentina's desperate equipment situation. A contract has been signed with the Toshiba Co. of Japan for the purchase of 200 electric cars for the General Sarmiento Railway's suburban services. The existing British units still operating on this line will be transferred to the General Bartoleme Mitre Railroad.

In addition Acevedo has recently signed contracts with both General Motors Corp. and General Electric Co. for a large number of badly-needed diesel units. General Motors is to supply within eight months 15 800-850 hp GA-8 diesel-electric locomotives, and 60 1310-1425 hp G-12 units. General Electric has received an order for 70 U13-C units rated at 1300-1420 hp. The delivery of these locomotives is expected to be completed within a year.

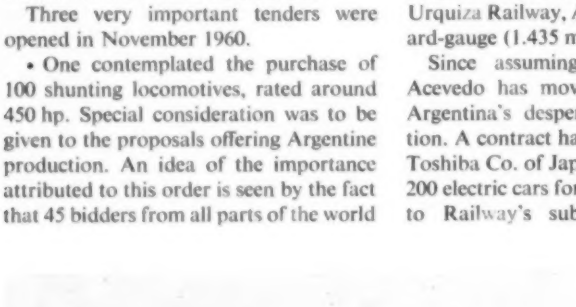
Using the emergency powers given him by the President, Acevedo placed both of these orders outside of the tender system at terms which were reportedly very favorable to Argentina from the standpoint of price and financing. The orders were also placed without drawing on the credit facilities offered by the World Bank. As a result World Bank funds can now be applied to the purchase of other badly-needed equipment such as 100 shunting locomotives.

Also under negotiation is the purchase of 5000 freight cars, with delivery phased at the rate of 600 a month.

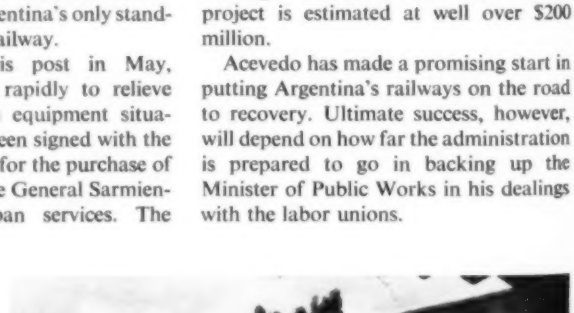
Acevedo has also ordered the sale of surplus real estate which will cut the deficit and bring in much needed revenue. The first lot of surplus real estate being put up for sale is valued at 10,000 million pesos and will yield the railways an expected 2,000 million pesos.

Future plans call for the replacing of all steam locomotives by 1970, and for the electrification of the suburban branch of the General Roca Railroad, which is the line most affected by equipment shortages. The cost of this electrification project is estimated at well over $200 million.

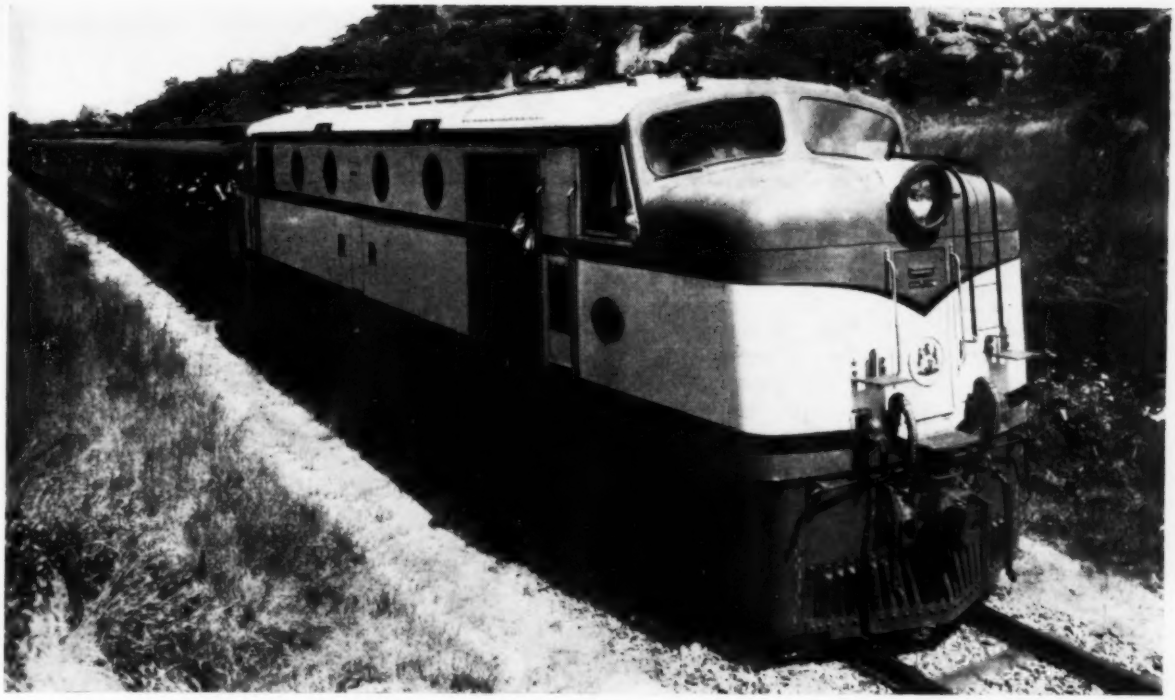
Acevedo has made a promising start in putting Argentina's railways on the road to recovery. Ultimate success, however, will depend on how far the administration is prepared to go in backing up the Minister of Public Works in his dealings with the labor unions.



Petroleum moves over San Martin Railroad to Buenos Aires



For many, rails are still the only means of communication



Feature of Rhodesia Railways' modernization program has been the introduction of 2000-hp diesel electrics

# Rhodesia Railways Plan Ahead

**Rhodesia Railways are savoring the fruits of a fourteen-year-old modernization program and turn-over in the last two years has been good enough, it would seem, to almost guarantee a rosy future. But Rhodesian experts are less optimistic. Economic difficulties, they warn, may prove overwhelming in the next three years, and RR officials are striving to forecast possible trouble spots.**

Because of its land-locked position in the heart of a vast continent, the Federation of Rhodesia and Nyasaland is the most railway-minded of the fast-developing younger nations of Africa. For more than sixty years its railways have played a leading part in shaping the country's economic growth and exploiting its natural resources. They continue to do so today.

Since 1947, when the Government of Southern Rhodesia took over the main railway network, a large-scale program of development and modernization has been carried through. Besides progressive mainline dieselization, measures such as color light signals and CTC have been introduced. (Some $12,000,000 is being spent on extending the scope of this last facility throughout the Rhodesian railway system.)

As a result of these developments and considerable expenditure on new and improved rolling stock, RR has more than doubled its passenger and freight carrying capacity in just over a decade.

Cecil Rhodes, the founder of Rhodesia, was a leading advocate for the spread of railways in Africa. At the end of the 19th century he and his associates built the first lines from South Africa and Portuguese East Africa to give the country a much needed access to the sea. This, however, was just part of Rhodes' more ambitious plan for a Trans-African railway of some 9656 km, stretching from the Cape to Cairo and linking all the territorial railways systems en route. Although the African trans-continental railway has never materialized, Rhodes's prediction that Rhodesia would eventually be opened to the coast "from all its frontiers" has certainly come true.

Rhodesia Railways today operates over routes totaling more than 4353 km and is linked to the systems of adjoining territories. It connects with South African Railways for direct access to and from major ports like Durban, Cape Town and Port Elizabeth, and with Mozambique Railways to the busy east coast harbours of Beira and Lourenco Marques —the two principal outlets for Rhodesia's overseas trade. There is also an important link to the west coast at Lobito Bay, Angola, via the Congo and Benguela railways.

In the opening decade of this century a network of lines spread rapidly across the Southern and Northern Rhodesias, following the arrival of the first train from South Africa (via the new line from Mafeking through Bechuanaland) at Bulawayo in 1897. The years of great railway building activity culminated with the opening of the Broken Hill-Congo border section in 1909. Since then a number of branch lines have been added to outlying agricultural and mining areas, and a new line built from Bannockburn to Malvernia, on the Mozambique border, to provide direct rail connection between the Rhodesias and Lourenco Marques.

This newest coast link-up, inaugurated in 1956, brought much needed relief to the heavily trafficked line to and from South Africa, and gave the Federation a second east coast port. Large annual

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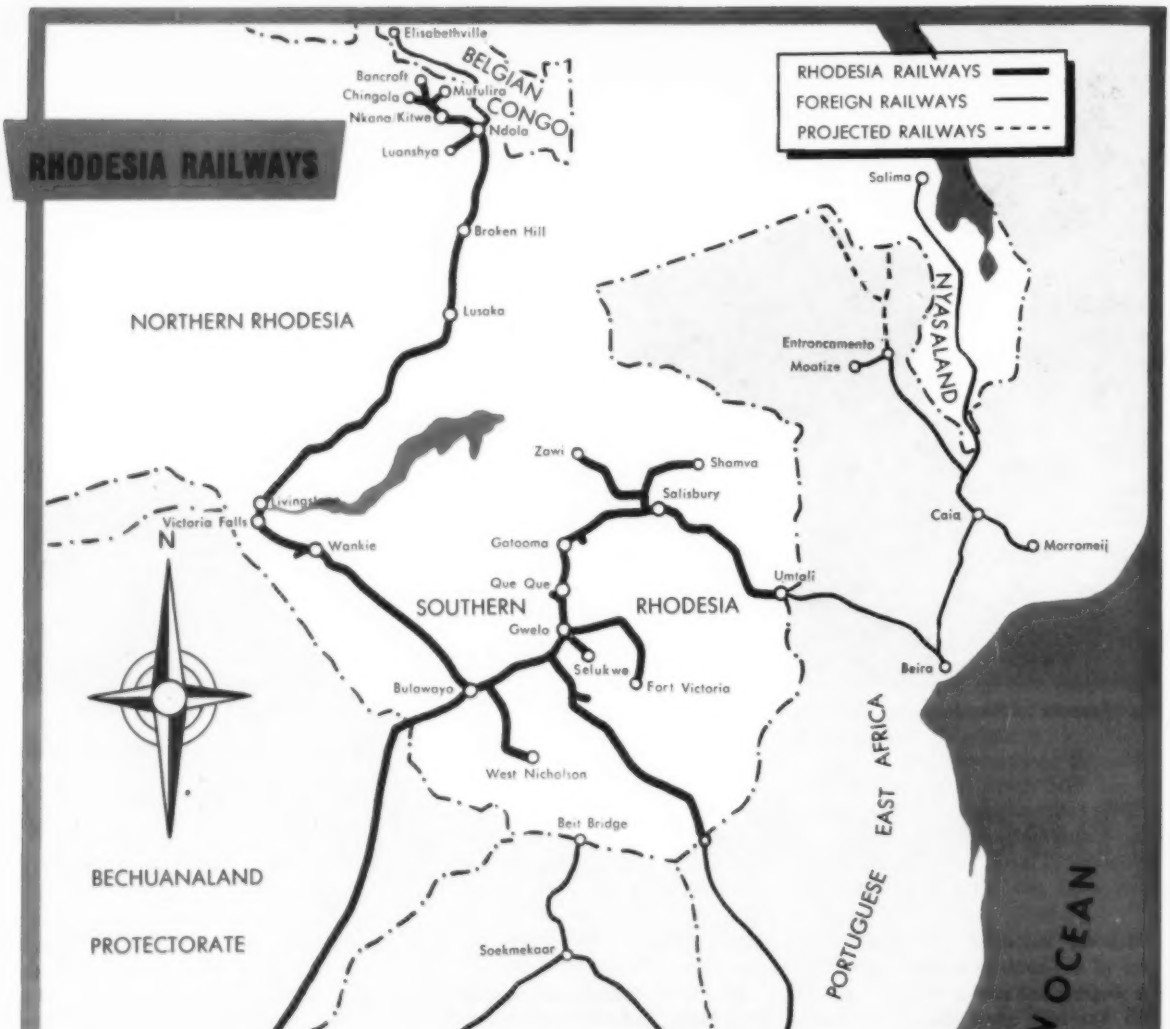



## RHODESIA RAILWAYS CONTINUED

tonnages are now being hauled to and from Lourenco Marques, including minerals from the interior and imported petroleum products in the opposite direction.

From Bulawayo the main line to Northern Rhodesia goes via Victoria Falls and Livingstone, lying well to the west of the most direct route north. It was originally intended that the Rhodesian part of the Cape-Cairo railway should go straight up through Mashonaland, but discovery of the rich Wankie coalfield, and also the scenic attractions of Victoria Falls, led to the westerly diversion of the line. Bridging the Zambezi River very close to the great Falls was Rhodes's idea. He insisted that the bridge should be within "splashing" distance so that "the trains as they pass will catch the spray from the falling Zambesi."

The Victoria Falls Bridge, opened in 1905, was not only a masterpiece of railway engineering but has since proved a powerful tourist attraction. It spans the river at a height of 106 m above the foaming waters, so that passengers gain a very remarkable close-up of one of the greatest natural wonders of Africa.

Ever since the Bulawayo-Victoria Falls line was opened, the distribution of coal from the Wankie coalfield (the only one in the Federation) has been the chief freighting task of Rhodesia Railways. More than a third of all this coal is destined for generating electricity in the country's thermal power stations. In future, however, as hydro-electric power

from the new Kariba Dam on the Zambesi increases, this coal movement will decline and other forms of railway freight will replace it. To meet the change, Rhodesia Railways is planning new and more specialized services for the heavy transport needs of the newer industries that have been established throughout the Rhodesias.

During the twelve months ending June, 1960, the railways carried a record breaking 11,702,537 tons. General freight accounted for 4,499,597 tons of the total compared with 4,222,158 tons for the previous year. That this boom came after a depressing fall of 10% was specially encouraging.

The trend continued in the financial year ending June 1961, when general freight shot up an additional half-million to a record of 5,124,539 tons. Over the same period liquid fuel and oils traffic rose by more than 11 million gallons to 135,560,000 gallons.

A resulting surplus of R4,000,000 (£2,000,000) is expected after allowing for loan service charges and other appropriations. Revenue is estimated at R66,000,000 (£33,000,000) and anticipated expenditure on revenue account is R54,000,000 (£27,000,000).

Economists say there are few signs of any immediate recession on the railway front, but they point out that 1961's estimated surplus is unlikely to be repeated next year. Dark side of the picture is capital. RR now faces a shortfall of about R14,000,000 (£7,000,000) badly needed for completion of development projects during the next three years. General Manager J. H. Allen recently announced that there was little likelihood of meeting this by external loans. Consequently the Rhodesian program has moved from the "highly desirable" to the "purely essential."

Despite the worrying shortage of funds, RR has gone ahead with plans for purchasing locomotives and rolling stock at a total cost of £2,862,000. Latest reports also indicate that there is no planned slow-down for future CTC projects.

One of the main features of the recent modernization program of Rhodesia Railways has been the introduction of 2000-hp diesel-electric locomotives for main line services. Thirty-five of these locomotives have already been supplied by the English Electric Company. They are the most powerful single unit diesel-electric locomotives yet designed for a narrow gauge railway.

The 273-km section between Salisbury, the Federal capital, and Umtali is one which, with its gradients and curves, high altitude and elevated ambient tempera-

CONTINUED

## Les Chemins de fer de Rhodésie préparent l'avenir

**Les Chemins de fer de Rhodésie jouissent des fruits de leur programme de modernisation de quatorze ans, et un avenir prometteur semble devoir leur être quasi assuré après les résultats d'exploitation satisfaisants des deux dernières années. Bien qu'il y ait peu de signes d'une récession imminente, les spécialistes rhodésiens mettent en garde contre des difficultés économiques qui pourraient prendre une grande ampleur. Les Chemins de fer rhodésiens ont actuellement besoin de 7,000,000 de livres environ pour mener à chef leur programme d'extension dans le délai prévu de trois années. Néanmoins, malgré ce capital qui leur manque, ils poursuivent l'achat de locomotives et de matériel roulant pour un montant de 2,862,000 livres. Ils ont commandé quatorze locomotives diesel-électriques pour 1,250,000 livres à la Brush Electric Engineering Co. Ltd. et seize autres véhicules moteurs du même type pour 1,300,300 livres à l'English Electric Co. En outre, ils ont passé commande à la Dorman Long (Africa) Ltd. de cent wagons à bogies couverts et de quinze wagons-citernes à huile de chauffage et à eau pour une somme de 312,700 livres. Indépendamment de cela, ils poursuivent la pose de la télécommande des signaux, qui s'étendra à la fin de cette année à 1094 km de lignes.**

## Die Rhodesischen Eisenbahnen (RR) planen für die Zukunft

**Die RR geniessen die Früchte ihres 14-jährigen Modernisierungsprogrammes und eine erfolgreiche Zukunft erschiene, nach den zufriedenstellenden Betriebsergebnissen der letzten zwei Jahre, als sozusagen gesichert. Obschon wenig Anzeichen für einen bevorstehenden Konjunkturrückgang vorhanden sind, warnen jedoch rhodesische Fachleute vor wirtschaftlichen Schwierigkeiten, die einen grossen Umfang annehmen könnten. Die RR stehen nämlich gegenwärtig vor einem Fehlbetrag von ungefähr £7,000,000, um ihr Entwicklungsprogramm innerhalb der vorgesehenen drei Jahre zu beendigen. Doch führen die RR, trotz diesem Kapitalmangel, die Anschaffung von Lokomotiven und Rollmaterial mit einem Kostenaufwand von £2,862,000 fort. Sie bestellten für £1,250,000 vierzehn diesel-elektrische Lokomotiven bei der Brush Electric Engineering Co. Ltd. und für £1,300,300 sechszehn weitere Triebfahrzeuge gleicher Art bei der English Electric Co. Ferner übergaben die RR für £312,700 einen Auftrag an Dorman Long (Africa) Ltd. für die Lieferung von 100 gedeckten Drehgestell-Güterwagen und von 15 Kesselwagen für den Transport von Feuerungsöl und Wasser. Auch die Einführung der signaltechnischen Fernsteuerung soll weitergehen und bis Ende dieses Jahres 1094 km umfassen.**

## Los Ferrocarriles de Rhodesia Planean para el Porvenir

**Los Ferrocarriles de Rhodesia cogen el fruto de un programa de modernización que se inició hace 14 años y los ingresos de los últimos dos años parecen asegurar un porvenir próspero. Sin embargo, los expertos son menos optimistas. Aunque, según ellos, hay pocos indicios de un retroceso inmediato, advierten que en los tres años que vienen, las dificultades económicas puedan resultar abrumadoras. Es la falta de fondos que ensombrece la situación. Los RR enfrentan hoy un déficit de aproximadamente R14.000.000 (£7,000,000), inversión que se necesita con urgencia para la terminación de proyectos de desarrollo en los tres años que vienen. Por consecuencia, sólo los proyectos esenciales serán terminados. A pesar de la falta de fondos el ferrocarril ha llevado adelante sus compras de locomotoras y de material móvil por un valor total de £2,682,000. Las locomotoras incluirán 14 Diesel-eléctricas de la Brush Electrical Engineering Co. Ltd. por un valor de £1,250,000 y 16 Diesel-eléctricas (valor £1,300,000) de la English Electric Co. Se han colocado pedidos por £312,700 para el suministro de 100 vagones de bogies cubiertos y 15 vagones tanque de la Dorman Long (Africa) Ltd. Noticias recientes no indican un retraso en la extensión del sistema CTC en la red y a fin de año el kilometraje total será de 1094 km.**

Technicians at work on CTC equipment in the workshops at Bulawayo

Wheel behavior is studied by TV camera mounted on RR locomotive

## RHODESIA RAILWAYS
### CONTINUED

tures, provides the most exacting conditions for diesel motive power. It offered a challenge to the designers to produce for this narrow-gauge line a powerful single unit diesel-electric locomotive having an axle load limitation of 15 long tons. The locomotives are hauling trailing loads of 850 short tons on 68 axles, a loading approximately greater by 12% than that of existing steam locomotives. At the same time, faster point-to-point timings are required without exceeding the 64 km/h speed limit for the section. The locomotives are also able to provide the necessary tractive effort to start a trailing load of 850 short tons on a 1 in 40 gradient, and of reaching speeds up to 88 km on more easily graded track with suitable trailing loads.

The power unit in each locomotive consists of an English Electric 16 SVT Mk II diesel engine with main auxiliary generators. The four-stroke, pressure charged diesel engine has 16 cylinders arranged in Vee formation. The main generator is bolted solidly to the engine bedplate and crankcase to form a compact and rigid unit, and the auxiliary generator is overhung on the free-end of the main generator. The power unit as a whole is mounted on a four point resilient suspension. The diesel engine is rated at 2000 hp at 850 rpm under standard conditions of temperature and pressure, and is started by motoring the main generator from a battery.

Last January one of these diesel-electric locomotives, No. 1208, set up a record on Rhodesia Railways by covering 22,625 km in a month's running. This record was achieved on the Bulawayo-Malvernia section on which diesel traction was introduced nearly three years ago. In the early months with diesels on this section the average monthly kilometrage was around 8851 km but this steadily increased until by the beginning of 1961 a number of units were frequently exceeding the 16,092 km-per-month mark.

In achieving its record, No. 1208 consumed roughly 113,649 liters of oil, or about 7 liters per 1.6 km. Probably the most important factor on the Malvernia run, however, is water, of which No. 1208 required only 690 liters for cooling purposes. This was all taken on at Bulawayo.

It should be emphasized that in obtaining these exceptionally high figures, normal service and maintenance were carried out strictly as laid down by Rhodesia Railways' regulations. In fact, of the total 744 hours in the month, No. 1208 was actually in use for about 694 of them, which means that the availability of these locomotives is in the region of 90%. This figure could, of course, be raised still higher, but it does help to put the capabilities of this type of unit in their true perspective, especially when it is remembered that the previous best kilometrage ever set up on Rhodesia Railways was 19,746 by a steam locomotive, in August 1960.

Locomotive No. 1208 was never restricted in any way to fast, light trains and in fact, during the month of its record it regularly worked all three types of the section, namely, pick up goods, through goods and mixed passenger trains. In addition, the speed restrictions of 56 km/h and 72 km/h (goods and passenger trains) had to be strictly adhered to, since speed recorders are attached to the entire diesel fleet.

Tribute to the success of these diesel electrics is implicit in a recent order for another 16 units worth £1,300,000 placed with English Electric Co. Ltd. by Rhodesia Railways.

Orders worth £1,250,000 for the supply of 14 diesel-electric locomotives have also been placed with Brush Electrical Engineering Co. Ltd. They will be similar to the 1365 and 1600-hp Type 2 units being provided to British Railways.

Destined for operation on RRs' 1.067-m narrow-gauge system between Bulawayo and Malvernia, the locomotives will be powered by Mirrlees JVS 12T 12-cylinder diesel engines, fitted with HSBT turbochargers and developing 1730 hp under the high ambient temperatures experienced in Rhodesia.

Although a few years ago Rhodesia Railways was advised by a team of consulting engineers to consider electrifying part of its main lines on the 50-cycle AC system, these orders indicate that it may be several years before electrification is introduced to the system.

After a careful assessment of requirements in view of the shortage of capital, RR has placed orders worth £312,700 with Dorman Long (Africa) Ltd. for the supply of 100 covered bogie wagons and 15 tank wagons suitable for fuel oil and water.

The covered wagons will cost £258,600 and are required for additional tobacco traffic to Beira—officially forecast to rise by 600 to 700 tons a week to 4200 tons weekly during the 1962 export season. Economically the orders are particularly sound because the peak tobacco period does not coincide with the rainy weather when the covered wagons will be used for general goods.

The tank wagons will cover the continuing increase in fuel oil traffic—1959, 121,804,000; 1960, 122,097,000; 1961, 133,560,000 gallons. In-service cost will be £44,100.

An important development on RR has been the extensive introduction of CTC and by 1963 all main lines, apart from the Somabula to Malvernia section on the Lourenco Marques run, will be CTC controlled. The only other exceptions will be the short double line sections and those stations where local control is being retained.

The first major installation in Northern Rhodesia was recently brought into operation—part of RRs' £5 million scheme for main-line CTC on the 1975-km section from Umtali to Ndola.

The section from Zimba to Kalomo will be CTC controlled soon; involving 56 km of track and six sidings. The Livingstone panel will then be fully operative, directing main-line train movements from Thomson junction (Wankie) to Kalomo, a distance of 260 km.

A further section is scheduled for operation in Southern Rhodesia on the 72-km line from Salisbury to Marandellas and there will be another extension of 65 km before the end of the year.

Sixty-one kilometers from Gwelo to Que Que will be equipped with CTC by December, 1961, bringing the total kilometrage up to 1094 km.

A Beyer-Garratt articulated locomotive leaves Bembesi siding on the Umtali to Ndola main line following the "all clear" signal from the CTC operator

The corner of a CTC and radio communications room, showing the operations control panel for 149 km of track on a section of the Bulawayo-Salisbury line

RR has overcome a big share of problems during CTC installation. Operation of axle counters on steel-sleepered sections was one. Where necessary, the sidings have had wood sleepers installed up to the home signals at each end of the siding, but the block sections have been left steel sleepered. The Siemens Halske magnetic counter has been adopted as standard and given good results to date.

One of the trickiest problems was the miscounting of locomotives fitted with flangeless wheels, but by fitting magnets the difficulty is being overcome. To help obviate lightning troubles, short track circuits were provided over the axle counter track devices so that when no trains are in section the axle counter proving lines on the overhead pole are permanently earthed.

At almost every siding in Southern Rhodesia, from Sawmills to Umtali, it has been possible to obtain power supply from the Electricity Supply Commission. Failure of the power is automatically shown on the control panel by an indication transmitted from the affected siding.

Diesel generators are installed at sidings where it is impossible to obtain a local supply. These are switched on and off by a control code, transmitted from control, and an indication is given on the panel that the generator has responded to the call. "Low voltage alarm" indications are transmitted from all sidings should the battery voltage fall below a pre-determined level.

On the earlier installations, difficulty was experienced with termites attacking buried cables. Various chemicals were introduced without success. It has now been decided to provide brass-taped cables wherever necessary. Normally, however, the cable running between ends of siding locations and between locations and home signals is suspended on rail pole routes.

CTC maintenance technicians are posted at outlaying stations and provided with Landrover transport where there is a good road running with the track. In the more inaccessible sections small motor trolleys have been used.

Consideration is now being given to adopting road-rail vehicles, and it is not beyond the bounds of possibility that light helicopters may be eventually used for track inspection.

RR has taken advantage of radio telephony for speeding facilities at various points on the system. Today, VHF is in use at Bulawayo, Salisbury and Gwelo, and there are plans to extend its application elsewhere.

Principally it is being used by the commercial department for express pick-up services, by the medical department, by the transportation department and, experimentally, in Bulawayo, for speeding shunting operations. In the Bulawayo area two shunting locomotives are equipped with two way sets.

Walkie-talkie sets are used by construction gangs on the signals and communications section of the chief engineer's department during the installation and testing of various signaling and CTC projects.

Despite the encouraging traffic increases in the past two years, new difficulties could follow the settlement of present political and economic problems in the Federation. Anticipating a resulting traffic challenge RR began streamlining its own organization earlier in the year.

In an attempt to achieve unity of command and quicker decisions the system of departmental control has been replaced by a "divisional" system. Three regions were established, one covering the Salisbury transportation district, the second the Bulawayo transportation district, and the third the Broken Hill and Livingstone districts.

Each region has been placed under the control of a regional manager, with greater powers than were previously vested in district officers. He is responsible for all day-to-day operations within his region–operating, commercial and mechanical (other than workshops), civil, signal and communications and electrical engineering. In respect of the engineering functions, day-to-day operations cover maintenance and minor new works. All the staff are now the direct responsibility of the regional manager who owes his own allegiance to the Railways.

At headquarters the former departments have been replaced by five divisions, each covering an easily defined sector of the RR undertaking. The five are as follows:

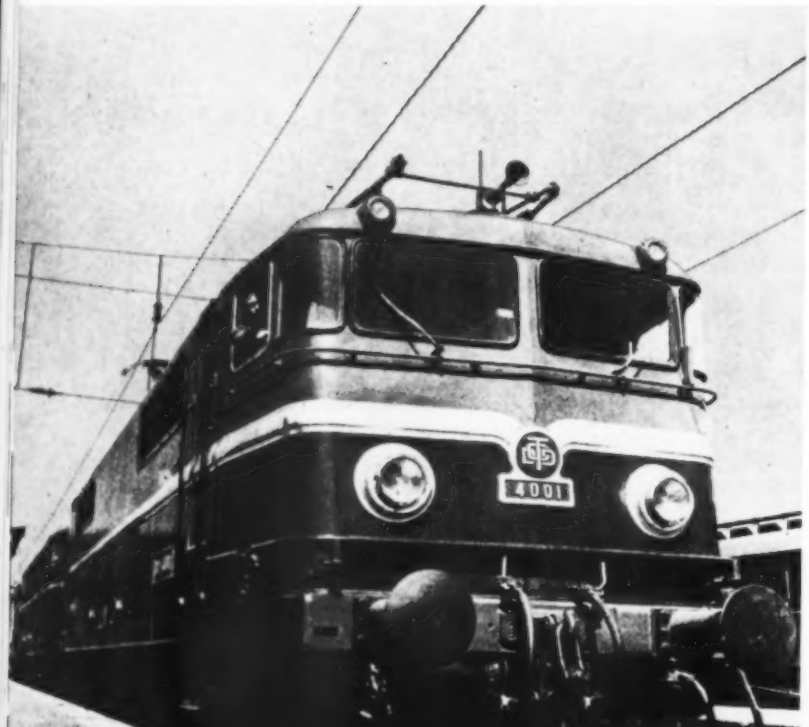
- Operations Division, responsible for general supervision and coordination of day-to-day work on the Regions.
- Engineering Division, responsible for the provision of track, signaling, communications, electrical supplies, all major new works and the means of movement.
- Commercial and Accounting Division, responsible for the economic well-being of the undertaking.
- The Planning, Research and Co-ordinating Division, which will control "backroom" work, cover long-term planning, effect the essential co-ordination between Divisions and maintain the necessary "control" statistics.
- Personnel Division, which will control policy for both European and non-European staff and cover day-to-day work in respect of all head office staff.

Re-organization of this magnitude can only be effected by stages and it is only in recent months that the changeover has neared completion. Possible results—not yet easy to detect—are expected to lead to greater economies and an increase in traffic efficiency.

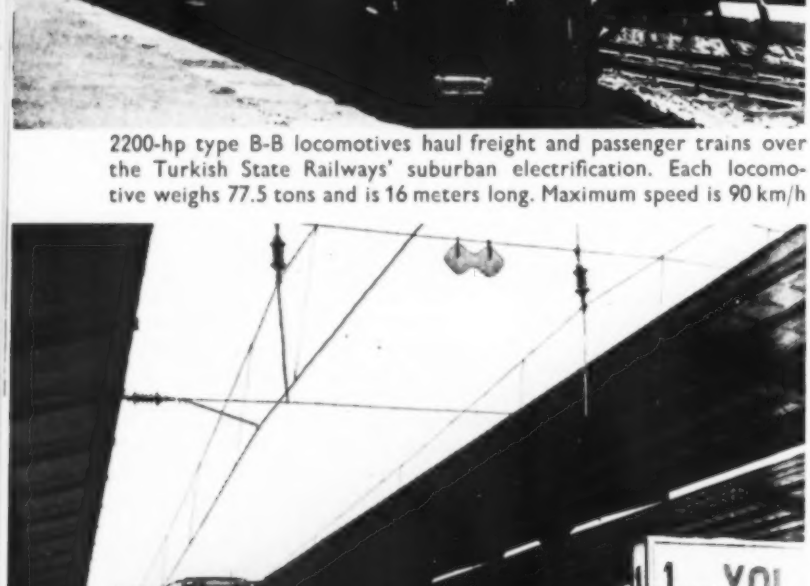
## Suburban Electrification

# Pays off

**Late in 1955 the Turkish State Railways (TCDD) opened what was not only Turkey's first electric railway, but also the world's first application of the industrial frequency single phase, 25 kv, 50-cycle system to suburban operation. In the five and a half years since its opening, traffic over the highly successful line has tripled, and TCDD has recently ordered additional equipment to meet the growing traffic needs.**




2200-hp type B-B locomotives haul freight and passenger trains over the Turkish State Railways' suburban electrification. Each locomotive weighs 77.5 tons and is 16 meters long. Maximum speed is 90 km/h




One of TCDDs' three type B-B locomotives arrives at Sirkeci station in Istanbul. In the five and a half years since its opening, traffic on the Sirkeci to Halkali electrified line has tripled in volume

Extending 27.6 km from Sirkeci station in European Istanbul to suburban Halkali, the electrification was placed in operation on 1 November 1955, replacing a steam hauled suburban service which extended over almost the same route. The inauguration of a considerably faster and more attractive electric service has encouraged rapid residential development in areas adjacent to the railway and greatly increased summer traffic to the popular Marmara Sea beach resorts served by the outer end of the line.

In 1955, the last year of steam operation, the suburban service from Sirkeci station transported a total of 13 million passengers. Only four years later, in 1959, the electric trains were carrying a total of 42 million passengers annually. The unsettled economic conditions following Turkey's 27 May 1960 military revolution caused a slight decline in 1960 traffic from the record 1959 level. This year, in order to reduce severe overloading of equipment until additional trainsets can be delivered, TCDD has adopted a temporary fare increase in order to discourage some traffic. A total of 16 million passengers was transported during the first six months of 1961 and a total for the year of about 36 million is anticipated.

The present 18 three-car trainsets, which have been in service since the opening of the electrification, will be supplemented by 12 additional three-car trainsets beginning early in 1962. At times of extremely heavy traffic the present trainsets have carried as much as double their normal capacity of 500 seated and standing passengers.

# ...off in Turkey

Planning for the conversion to electric operation of the Istanbul suburban service out of Sirkeci station began in 1952. To provide adequate capacity for a high density service, the suburban line was almost entirely rebuilt. Double track was extended an additional 5 km to Halkali from Menekse station, which had been the outer terminal for steam suburban operation.

The track structure itself was rebuilt with 46-kg/m rail, butt welded in sections of four 12-m rails, and laid on treated timber sleepers and crushed stone ballast. Maximum grade on the line is 12.5 mm/m. All suburban stations were provided with car floor-level platforms for rapid loading and unloading. Extra tracks and crossovers for turnback schedules were installed at Bakirkoy, Yesilkoy and Florya, located respectively at 13, 18, and 21 km from Sirkeci. Four high-level platforms exclusively for suburban trains were constructed at Sirkeci station. Two additional low-level platforms are available for the international services and local trains operating through Halkali. Ticket offices, waiting areas, and gates for the two services are separate.

The entire electrical installation for the line was manufactured and installed by a group of French firms, headed by Alsthom. A single 14,000-kva substation at Veliefendi delivers the necessary 25-kv power for the entire line. Located at a distance of 10 km from Sirkeci, the substation is at the approximate load center of the line, since traffic is somewhat heavier on the inner portion.

Power at 35 kv is delivered to Veliefendi from two separate sources in parallel. One line delivers power from Silahtar Central, a thermal generating plant at the upper end of the Golden Horn operated by the Istanbul power company (IETT), while a second line delivers power from Beyazit Central, a distribution station which in turn receives power from transmission lines extending across the Bosphorous and connecting

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## Succès de l'électrification en Turquie

**Les Chemins de fer de l'Etat turc ont mis leur première ligne électrifiée en service à fin 1955. C'était la première fois dans le monde que du courant industriel alternatif monophasé de 25 kV et 50 périodes était utilisé pour une ligne de banlieue. Sur cette ligne de 27,6 km autrefois exploitée à la vapeur, qui relie Sirkeci dans la ville européenne d'Istamboul au faubourg de Halkali, le trafic a triplé dans les cinq ans et demi qui suivirent l'électrification, et les Chemins de fer de l'Etat turc viennent de passer commande d'un équipement supplémentaire pour faire face aux besoins accrus. La traction électrique, sensiblement plus rapide et plus agréable, a favorisé la construction de logements dans les parages de la ligne et considérablement contribué au développement du trafic d'été vers les plages de la mer de Marmara. En 1955, dernière année d'exploitation à la vapeur, 13 millions de voyageurs furent transportés; en 1959, on en dénombrait déjà 42 millions. Les prix ont été provisoirement augmentés pour réduire le nombre des voyageurs en attendant de nouvelles compositions. On escompte 36 millions de personnes pour cette année.**

## Erfolgreiche Elektrifikation in der Türkei

**Ende 1955 eröffneten die Türkischen Staatseisenbahnen (TCDD) ihre erste elektrifizierte Eisenbahnlinie, wobei zum ersten Mal in der Welt eine Vorortbahn mit Industriefrequenz-Einphasenwechselstrom von 25 kv, 50 Perioden, betrieben wurde. Der Verkehr auf dieser früher mit Dampf betriebenen 27,6 km langen Strecke, die Sirkeci im europäischen Istanbul mit dem Vorort Halkali verbindet, hat sich in den fünfeinhalb Jahren seit ihrer Elektrifizierung verdreifacht und die TCDD bestellte kürzlich zusätzliche Ausrüstung, um den wachsenden Bedürfnissen gerecht zu werden. Der wesentlich schnellere und angenehmere elektrische Betrieb hat den Wohnungsbau in der Nachbarschaft der Linie gefördert und dazu den Sommerverkehr nach den beliebten Strandorten am Marmarameer bedeutend erhöht. Während diese Vorortbahn im Jahre 1955, dem letzten unter Dampfbetrieb, 13 Millionen Reisende beförderte, waren es im Jahre 1959 bereits 42 Millionen. Um der Überfüllung der Züge zu steuern, bis neue Kompositionen eingesetzt werden können, hat die TCDD dieses Jahr die Fahrpreise vorübergehend erhöht, was die Jahresfrequenz auf 36 Millionen Reisende vermindern soll.**

## Electrificación Turca es un gran éxito

**Al fin del año 1955 los Ferrocarriles del Estado Turcos (TCDD) inauguraron lo que era no sólo el primer ferrocarril eléctrico de Turquía, sino también la primera aplicación del mundo de la frecuencia industrial monofásica, 25 kv., 50 períodos, a la operación de cercanías. Desde entonces el tráfico en la línea se ha triplicado y los TCDD han pedido recientemente equipo adicional para satisfacer a la demanda creciente. La electrificación substituyó a un servicio de cercanías a vapor y tiene una longitud de 27,6 km de la estación Sirkeci en Istanbul europeo al suburbio Halkali. La inauguración del servicio eléctrico más rápido y más atractivo ha fomentado la construcción de viviendas en áreas adyacentes al ferrocarril y incrementado considerablemente el tráfico de verano a la playa del mar de Mármara. En 1955, el último año de la operación a vapor, la línea transportaba un total de 13 millones de pasajeros de la estación Sirkeci. Sólo cuatro anos después, en 1959, los trenes eléctricos transportaban 42 millones de pasajeros anuales. Este año, con el fin de evitar la sobrecarga hasta que se puedan adquirir ramas adicionales, los TCDD han adoptado una elevación de las tarifas, y se cuenta con 36 millones de pasajeros.**

## Turkish Electrification

CONTINUED

Istanbul to thermal and hydro-electric generating plants in Anatolian Turkey.

The entire electrified section is provided with a system of automatic block signals, and an inductive type automatic train stop system, both manufactured by Siemens of Germany. The entire line is under the control of a dispatcher located at Sirkeci and is subdivided into seven sections under the control of operators at Sirkeci, Yenikapi, Yedikule, Zeytinburnu, Bakirkoy, Yesilkoy, and Halkali.

The 18 three-car trainsets presently operated in the suburban service were constructed by a group of French firms made up of Alsthom, Jeumont, Le Matériel Electrique S.W. (Schneider Westinghouse), SFAC (Usines Schneider), and De Dietrich & Cie. Ordered early in 1953, the equipment was delivered in 1955. Each trainset is made up of a motor car at each end, with a central trailer car. A control cab is provided at both ends of each trainset for reversible operation. Car bodies, constructed by Dietrich, are of arc welded steel construction. Each motor car provides space for 79 seated and 87 standing third class passengers, while the central trailer car accommodates 84 seated and 84 standing second class passengers. Each car has four double-opening electro-pneumatic doors on each side, controlled from the cab. Overall length of each trainset is 68 meters, and their total weight is 127 tons empty and about 164.5 tons with a normal full load. Their maximum speed is 90 km/h.

Each motor car has a single power bogie at the front end, equipped with two, 250 volt AC, Alsthom TAM 639, nose-suspended traction motors with a continuous rating of 345 hp and an hourly rating of 370 hp. The Alsthom bogies are of arc welded steel construction, and are equipped with roller bearings. The need for bogie lubrication has been eliminated by employing rubber articulations or manganese steel wearing pieces. A 510 kva oil-immersed transformer, compressor, controller, and other apparatus are mounted under the floor of each motor car. Each trainset is equipped with Scharfenberg couplings which automatically make mechanical, air, and electrical connections. As many as three trainsets may be operated in multiple.

Except for minor modifications and improvements, the 12 additional trainsets now on order from the same group of French manufacturers will be identical to the original equipment.

To power through passenger and freight trains over its suburban electrification TCDD also acquired three B-B type locomotives from the same group of manufacturers. These locomotives were ordered early in 1953 and delivered in 1955. Each locomotive weighs 77.5 tons and is 16 meters long. They have a continuous rating of 2200 hp and an hourly rating of 2320 hp. Maximum speed is 90 km/h.

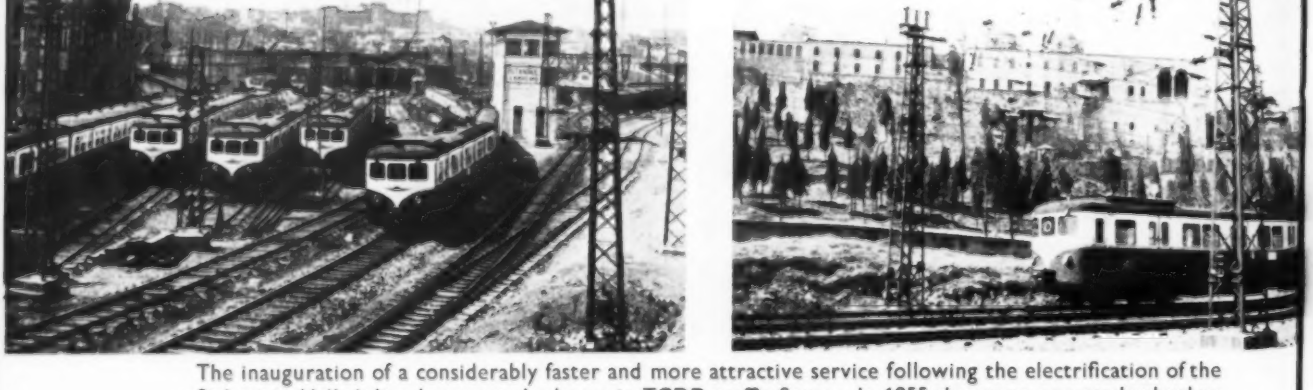
Each bogie is equipped with two 300 volt AC, Jeumont type MS 72 traction motors. The bogies, manufactured by Alsthom, are of arc welded steel construction, equipped with roller bearings. A separate blower provides ventilation for the motors on each bogie.

A single 2790 kva oil-immersed transformer, compressors, blowers, and control and auxiliary equipment are mounted within the body of the locomotives.

The traffic pattern for TCDD's electrification is similar to that for most suburban operations, with peak movements occuring between 6 and 9 a.m. and again between about 4 and 8 p.m. On weekdays 71 outbound and 72 inbound trains are operated, with trains arriving and departing from Sirkeci on headways as close as 10 minutes during the peak periods. This traffic pattern is substantially altered during the summer period from about mid-June to the end of September, when traffic is heavy to the Marmara Sea beach resorts at Yesilkoy, Florya, Menekse, Kucuk Cekmece, and Soguksu. Instead of declining between the peak morning and afternoon periods, traffic remains heavy throughout the day and usually continues heavy until 9 or 9.30 p.m. The beach traffic is at its heaviest on Sundays, when total traffic over the line is as much as double that experienced on a normal weekday. During the summer period TCDD schedules 82 suburban trains in each direction on Sundays, and from 8 a.m. to 9 p.m. a train arrives or departs Sirkeci every six minutes on the average.

Electrification permitted a substantial decrease in running times over those required for the former steam service. For example, the running time to Florya, the furthest principal station reached by the former steam service, was reduced from 50 minutes to 32 minutes with the introduction of electric operation. The present running time over the entire 27.6 km to Halkali, including 15 intermediate stops, is 42 minutes, an average speed of almost 40 km/h.

To operate its high density Istanbul



The inauguration of a considerably faster and more attractive service following the electrification of the Sirkeci to Halkali line has created a boom in TCDD traffic figures. In 1955 the steam operated suburban service was carrying 13 million passengers. By the end of this year a total of 36 million is anticipated

suburban service with only 18, three-car trainsets, TCDD must obtain an unusually high average of 10,000 km a month from each of them. To do so under the conditions prevailing in a surburban service requires an exceptionally high standard of availability, which TCDD has developed through careful scheduling of periodic inspection and maintenance work, with a well equipped shop that is geared to the performance of maintenance and repair work with a minimum out-of-service period. This shop, located adjacent to Sirkeci station, performs all classes of electrical maintenance and repair, and all mechanical work except major overhauls, which are performed at TCDD's Adapazari car shops (p. 42, IRJ, July, 1961).

The Sirkeci shop, which employs 116 men, is provided with three inspection tracks, each accommodating a single trainset. Each trainset receives a weekly inspection, which requires about four hours, and every fourth week receives a monthly inspection, requiring about a day and a half. Under present traffic conditions careful scheduling of these inspections is required to maintain the necessary number of trainsets in service. Normally, 14 or 15 trainsets are required to cover peak period schedules. During the summer period, however, when beach traffic is heavy, the entire fleet of 18 trainsets must be available to cover peak requirements on Sundays.

The operating conditions existing on TCDD's Sirkeci-Halkali electrification have proven unusually rigorous on running gear of the suburban equipment. For example, no less than 25% of the 27.6-km route is made up of curves of 500 m or less in radius, and the most restrictive is only 227 m in radius. As a result, flange wear is excessive, and TCDD has found that it must return wheels about every 120,000 km. Stations on the route are spaced at an average distance of less than 2 km, and the frequent starts and stops subject traction motors to severe service conditions.

As a result of conditions of this type, bogie and traction motor repairs are among the most frequently encountered items of work, and the Sirkeci shop has been particularly well equipped to handle it. To avoid lengthy out-of-service periods for equipment requiring running gear work, the shop maintains a reserve of four motor and four trailer bogies, and is equipped with four drop pits to permit rapid replacement of defective bogies. Normally, a trailer bogie can be replaced in a total elapsed time of one hour from the time a trainset arrives at the shop until it is again ready for service. Replacement of a motor bogie takes a little longer. The shop is fully equipped for such major traction motor work as commutator repair, rewinding and balancing.

The Sirkeci station signal tower operator controls all train movements from Sirkeci to Kumkapi. The line is governed by automatic block signals and is equipped with electrically operated switches

Highly satisfied with the success of its initial suburban electrification at Istanbul, the Turkish State Railways plans a greatly expanded electrification for the future. Most of the system's lines support only a light traffic density, which can be more economically operated with diesel-electric power. However, both the 578-km Istanbul–Ankara main line and the 485-km line from Ankara to the Black Sea port of Zonguldak, which carries a heavy mineral traffic, are considered to have a traffic density sufficient to warrant electrification. TCDD's electrical engineers estimate, as a rough rule of thumb, that for a steam operated line on which fuel consumption exceeds about 200 tons of coal per km annually, electrification can be economically applied. Annual consumption on the Istanbul–Ankara–Zonguldak line averages about 350 to 500 tons of coal per km.

A detailed electrification study of the Istanbul–Ankara–Zonguldak line made in 1954 indicated that the project was both economical and practical from the point of view of existing or already planned transmission lines and generating plant capacity. At the present time an estimated surplus generating plant capacity of 350,000,000 kw hours annually would be available to such an electrification. The estimated annual power demand for the Istanbul–Ankara route only, at the current traffic level, would be about 120,000,000 kw hours.

The same single phase, 25 kv, 50-cycle system employed for the present Istanbul electrification is planned for a future Istanbul–Ankara–Zonguldak electrification. Locomotives for this service would probably be of the silicon rectifier type, with DC traction motors, rather than the AC traction motor type presently operated on the Istanbul electrification. Whether AC-motor, or DC-motor-with-rectifier suburban equipment would be employed has not yet been decided. Heavy suburban services extending 32 km east from Haydarpasa station in Istanbul, and a total distance of 37 km east and west from Ankara, are included in the route for which electrification is proposed. At such time as the planned electrification is realized, the diesel-electric locomotives presently planned for service on the Istanbul–Ankara route (p. 38, IRJ, June, 1961) would probably be transferred to lines in the Adana region on the Mediterranean coast, where severe operating conditions are encountered in the Taurus Mountains.

## Great Britain:

# New Automated Yards Will Speed Freight on the BR

**Construction of large, fully automated marshalling yards is a major feature of the British Railways, modernization plan. Set up at key centers throughout the country, they will assist in the provision of faster transit times, increased reliability, and punctuality.**

**So far, three major yards have been built and are already in operation—in Scotland, South Wales and the London area. They are typical "blueprints" for those now planned or already under construction.**

Among the most up-to-date in Europe, and the largest of the four under construction in the North Eastern Region, is that at Newport, Middlesborough.

The existing yards (two "up" and two "down")—substantially unchanged for fifty years—are quite incapable of dealing efficiently and economically with increasing freight traffic. For some time the need for something bigger and better has been evident. Thus two new modern yards (one "up" and one "down") were planned, and in 1959 work on the site at Newport began.

Estimated to cost £3,750,000, yard facilities will include: automatic switching; mechanical two-stage retarding; color-light signaling, with repeater signals in hump locomotive cabs; and a radio telephone system linking the control towers and key points with the yard shunting engines.

Pattern of operation will be the usual modern one of breaking up an unsorted train into cuts, according to destination. Diesel shunters will propel the cuts over the hump and points will be automatically aligned to direct each cut to its appropriate siding. Weight and speed of cars will be automatically assessed and their spacing regulated by electronically controlled primary retarders. After this, semi-automatic secondary retarders will take over to bring the carsto a halt where required.

Some 48.2 km of line in the area, now controlled from four signal boxes, will be remotely controlled from a console unit in the "down" yard control tower.

An operator will be able to set 315 separate routes and control 106 signals and 131 power driven points. The yard will be floodlit from eleven 45.7-m-high lighting towers.

Second of the North Eastern region yards now under construction, is at Lamesley, near Gateshead. When completed, Lamesley will take over the work of nine small old type yards and serve the whole industrial Tyneside. This concentration of operations will eliminate much of the intermediate staging of traffic between yards and will cut by half the daily number of freight car movements in the area (from 6500 to 3500).

Operations will be directed from a central control tower overlooking the hump and 48 sorting sidings.

Healy Mills, near Wakefield, is the site of yard number three. The present facilities consist of three reception and 31 sorting sidings with accommodation for 1572 cars. The new yard—costing £3,000,000—will have 14 reception tracks holding 850 cars, 50 primary sorting sidings accommodating 2750 cars and 28 secondary sorting sidings holding 1050 cars. There will be two primary and eight secondary retarders and facilities will include a talk-back loudspeaker system and two-way radio, linking the tower and diesel shunting locomotives. The control tower will incorporate power operated signal box replacing several existing old-type boxes. Construction of this east-west yard involves the diversion of the river Calder and 1,500,000 tons of ballast are being dumped in the old riverbed to raise the level of the site.

Approval has recently been given to go ahead with the fourth yard at Stourton near Leeds. Planned to deal with freight traffic passing in a north-south direction, it will replace 14 smaller yards. When in use in about three years' time, 3500 to 4000 cars a day will be sorted at Stourton. Facilities will be similar to those at other yards.

On the Eastern Region work is about to begin on a £9,000,000 modernization scheme in the Sheffield area, involving a marshalling yard and freight and diesel depots. The scheme is the Region's answer to the problem of coordinating

The newest British yard is at Margam in South Wales – a two way facility which can receive and despatch traffic of up to 4000 cars every day in both directions

the work presently carried out in 11 marshalling yards, four freight depots and five motive power depots in the area.

The new yard is to be built on the north side of the Sheffield district line between Catcliffe and Tinsley. By the construction of four connecting lines, the yard will be strategically placed to sort inward and outward traffic flows in the area.

Within the complex industrial area to be served by the yard is a vast traffic potential which, for the first time, will be able to be brought together at one place, making it possible to deal with most of it by means of through long-distance trains. Since Sheffield is located at the focal point of a number of important freight routes, it will be possible to schedule regular through services to and from London, East Anglia, South Wales, Hull, the north-east coast, Carlisle and Scotland. At present traffic levels, an average of 260 trains will enter or leave the new yard daily and some 5000 cars will require marshalling each working day.

The main yard will have 48 sorting sidings and the secondary yard 26. The secondary yard is necessary because the large industrial complex in Sheffield calls for at least 130 sorts. A division into main and subsidiary marshalling is the most economical way of achieving this.

Both yards will have humps with two stage fully automatic retardation in the main yard and single stage retardation in the secondary yard. Facilities will include color-corrected mercury vapor lighting, two way radio communication between diesel shunting locomotives and yard staff and a loudspeaker address system.

Two new signal boxes will be built and signaling installations will incorporate simple train describing apparatus and the respective areas will be color-light signaled throughout.

In Scotland, work is well advanced on a new yard at Perth where presently there are four old yards, resulting in considerable transfer movement and double-handling of cars, all of which is time consuming and unproductive.

The new installation will have six reception sidings and 30 double-ended sidings. Two small groups of secondary sorting sidings will also be provided to enable local trains to be made up in the right order to serve wayside stations.

Incoming trains will be examined and split into cuts according to destination. The cut list will be passed by pneumatic tube to the control tower which will, by means of a keyboard, transfer siding numbers to a punched tape. Points will be set in accordance with the cut card and

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## Nouveaux Chantiers de Triage Augmenteront Efficience Britannique

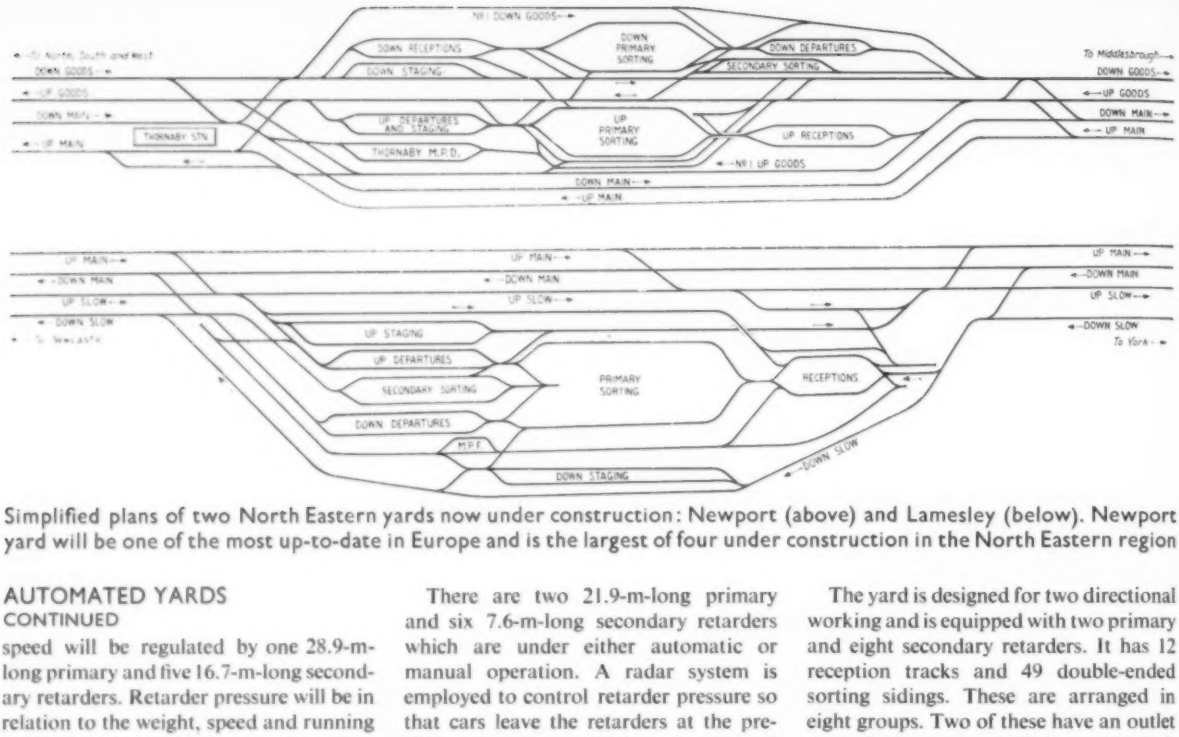
**La construction de grands chantiers de triage entièrement automatiques est un des points principaux du plan de modernisation des British Railways. Situés aux endroits importants à travers le pays ils permettront des délais de transport plus rapides, plus grande sécurité et ponctualité. Trois ont été construits jusqu'à présent — en Ecosse, Galles Méridionale et Londres —. Le besoin de ces chantiers, ainsi que de ceux prévus pour les prochaines années, s'est manifesté depuis quelque temps. Les anciens — en grande partie inchangés depuis des années — ne sont maintenant plus à même de manipuler d'une façon efficace et économique le trafic accru de marchandises. Un des chantiers les plus modernes jamais construits en Europe est en voie de construction dans la région nord-est et coûtera environ £ 3.750.000 Il comprendra aiguillage automatique, rail-frein mécanique à deux phases, signalisation à feu de couleur avec signaux répétiteurs dans la cabine de locomotive de bosse, et un système radiotéléphonique reliant les postes de contrôle et les positions clefs avec les machines de manoeuvre. Le travail s'effectuera de la façon moderne habituelle de diviser un train non trié en sections selon la destination.**

## Neue Rangierbahnhöfe erhöhen britische Leistungsfähigkeit

**Der Bau grosser, vollautomatischer Verschiebebahnhöfe ist ein Hauptpunkt des Modernisierungsplanes der britischen Eisenbahn. Über das ganze Land verteilt werden sie Schlüsselstellungen einnehmen, die dazu beitragen, die programmierten schnelleren Durchlaufzeiten, grössere Zuverlässigkeit und Pünktlichkeit, auszuführen. Bis jetzt wurden drei errichtet — in Schottland, Südwales und London. Die Notwendigkeit dieser neuen Verschiebebahnhöfe und anderer, die in den nächsten Jahren betriebsfertig werden, macht sich bereits seit einiger Zeit bemerkbar. Die alten — meistens seit Jahren unverändert — sind nicht mehr imstande, den heutigen Güterverkehr in zweckmässiger und wirtschaftlicher Weise zu verarbeiten. Einer der modernsten Rangierbahnhöfe, die jemals in Europa angelegt wurden, befindet sich jetzt im Nordost-Bezirk im Bau und wird nicht weniger als £ 3.750.000 kosten. Die Anlagen werden mit automatischer Schaltung, mechanischer zweistufiger Gleisbremsung, Farblicht-Signalisierung, Signalwiederholungen in Rangierlok-Kabinen, mit Funksprechanlagen, die die Ablaufstellwerke und Weichenstellwerke mit den Rangierlokomotiven des Bahnhofs verbinden, ausgerüstet; die Waggons eines Zuges werden automatisch entkoppelt und bestimmungsgemäss abgeschoben.**

## Nuevos patios incrementarán la eficacia británica

**La construcción de largos patios enteramente automáticos de clasificación en los puntos centrales del país forma una parte esencial del plan de modernización de los Ferrocarriles británicos. Tales patios harán posible transporte más rápido y mayor puntualidad. Hasta ahora tres han sido construídos — en Escocia, Gales del Sur y Londres. Desde hace algún tiempo la necesidad de tales patios de clasificación ha sido evidente. Los antiguos — que no han ido con el tiempo — no pueden hacer frente de manera eficiente y económica al incremento del tráfico de carga. En la Región del Noreste se está construyendo actualmente uno de los patios más modernos de clasificación de Europa, el que costará aproximadamente 3,75 millones de libras esterlinas. Las instalaciones incluirán la clasificación automática, frenos de vía en dos etapas, señalización en luces de color, señales repetidoras en las casetas de las locomotoras de lomo de asno y un sistema radiotelefónico uniendo los puestos de mando y los cambios centrales con las locomotoras de maniobras. El modo de operación será el moderno de separar las partes de un tren mixto de acuerdo con su destino.**




Simplified plans of two North Eastern yards now under construction: Newport (above) and Lamesley (below). Newport yard will be one of the most up-to-date in Europe and is the largest of four under construction in the North Eastern region

## AUTOMATED YARDS
### CONTINUED

speed will be regulated by one 28.9-m-long primary and five 16.7-m-long secondary retarders. Retarder pressure will be in relation to the weight, speed and running characteristics and distance to be run.

Within the area where the yard is situated, all signaling is being revised and modernized. A new signal box is under construction near Perth station and this will replace the 13 mechanical boxes in use at present. The route setting installation will be of the type whereby the turn of a switch and the depression of a button will set up an entire route.

Of the three fully-mechanized "modernization plan" yards already completed, the first was at Thornton on the Scottish Region. It has 41.8 km of track and can handle up to 3000 cars a day. It was the first British yard to have both primary and secondary retarders and to incorporate automatic equipment to measure the weight and speed of each cut of cars, between hump and retarders. Another feature was that it was laid out to deal with both up and down traffic in the one yard whereas previous practice had been to provide separate up and down yards.

There are six reception tracks having a total capacity of 375 cars. The 35 sorting sidings accommodate a total of 2311 cars.

The procedure is for a train on the reception track to be checked, uncoupled and a cut card made out. Copies are sent by pneumatic tube to the hump inspector's office who sends one copy, also by pneumatic tube, to the control tower. Buttons on the control panel, numbered to correspond with the sorting sidings, are pressed in accordance with the order on the cut list. Up to 48 cuts can be stored.

There are two 21.9-m-long primary and six 7.6-m-long secondary retarders which are under either automatic or manual operation. A radar system is employed to control retarder pressure so that cars leave the retarders at the preselected release speed. The control panel incorporates signal and point buttons in their geographical positions. Two switches are provided for each retarder; one for selecting the leaving speed of cars and the other for setting the retarder to automatic or, when working manually, to set light or heavy retardation or no retardation at all. Six leaving speeds can be selected from 4.8 km/h to 12.8 km/h. The operator can over-ride the automatic point-setting equipment if required. Hump movements are supervised from the control tower, but are subject to the over-riding direction of the hump yard inspector located at the crown of the hump.

Two-way loudspeaker communication is provided between control tower, point area and hump inspector. There is also an extensive telephone system. Closed circuit television is located in the yardmaster's office at the east end of the sidings. Two cameras are mounted on a post at the west end of the yard—one facing the hump and the other down the yard. Each receiver has controls for focusing, panning, raising and lowering the camera by remote control.

Second of the fully automated yards to come into use was at Temple Mills in the London area. It is 3.2 km long, incorporates 83.6 km of track and can handle up to 4500 cars a day. It replaces 10 smaller yards, as well as five periphery yards. Six old signal boxes have given way to two panel operated (on the entrance-exit principle) boxes and one mechanically operated box.

The yard is designed for two directional working and is equipped with two primary and eight secondary retarders. It has 12 reception tracks and 49 double-ended sorting sidings. These are arranged in eight groups. Two of these have an outlet towards the west end of the yard, which enables clearance to be effected with out interfering with departures at the east end. Traffic can also leave in either direction from the eight departure sidings.

The hump includes a reversing spur beyond the crown, enabling two diesel hump shunting locomotives to operate with a minimum of delay. Between the two primary retarders is the tower, where an operator sets the routes for the cuts of cars. All signals and points are controlled by miniature switches. A teleprinter transmitter incorporated in the operator's desk relays information to the control tower which is initiated from a direct connection to the route setting and cut push buttons. No separate teleprinter keyboard is required. Depression of a route-setting button and a cut description button on the hump tower control desk transmits the code to the teleprinter receiver in the control tower. A record of this transmission is printed on a paper tape with the route number of the cut on the left and the number of cars on the right.

The primary retarders are equipped with automatic control enabling predeterminded braking pressures to be applied before the cars enter the retarders and ensuring correct leaving speed. Secondary retarders are manually operated by switches on the control desk. The automatic control of the primaries is governed by radar apparatus.

Communications equipment in the yard include a self-contained telecommunications network with a 100-line private

automatic branch exchange. A two-way radio network provides a link between diesel shunters, the hump tower and the control tower. Finally there is a loudspeaker system throughout the yard and departure areas.

Newest yard is at Margam in South Wales—a two-way facility which can receive and despatch in each direction traffic of up to 4000 cars a day. Cut cards are made up on punched tape from teleprinter records. Setting of points is automatic via a tape reader apparatus in connection with track circuits. Details of cuts are transmitted to the control tower by portable radio.

Margam occupies an area of nearly two hectares and has 12 reception sidings and 50 double-ended sorting sidings. The reception sidings converge on a single track over the hump. On the falling gradient beyond the crown are two primary and eight secondary retarders. Track joints in the yard are, except for insulated joints, site-welded by the Thermit or Quick processes.

The handling of cars into the reception sidings and through to the sorting sidings is controlled from the control tower. The control panel in the latter consists of a diagram of the track layout, the right hand end providing control for the signaling in the reception sidings on the route system. The left hand panel provides an over-riding manual control for the points in the approach to the sorting sidings and for the retarders.

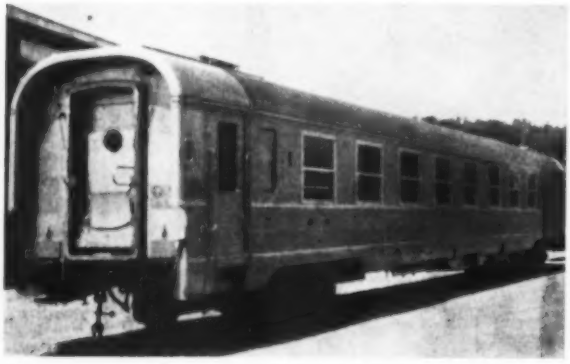
Control of the retarders is entirely automatic. The correct release speed is worked out by a computer which takes into account the running resistance of the car, the distance it has to run, and the curvature of the track. The correct pressure is applied to the retarder by means of a servo-system which takes into account the required leaving speed and weight of the car.

Diesel shunting locomotives are provided with two-way radio linking them to the control tower. Humping signals are also repeated in the cabs of the diesels—a feature new to a British yard. There is also an extensive telecommunications network throughout the yard as well as a loudspeaker system.

Experience has shown that the automatic control equipment results in better yard operation than was attainable by previous methods. The yard functions easily and well, and although so far the traffic handled has been only about one-half of the designed capacity, it could comfortably deal with the intended 4000 wagons a day. So far as design is concerned, this is basically good but operation has shown that more reception sidings could be used with advantage.

The control tower at Margam (above) directs cars into the twelve reception sidings and fifty double-ended sorting sidings (below). The panel provides control for reception signaling and over-riding manual control for points and retarders

# Products of Interes



## French All-Stainless-Steel Car

Wagons français en acier inoxydable construits sous licence.
Unter Lizenz gebauter französischer Wagen aus rostfreiem Stahl.
Coche francés de acero inoxidable, construido bajo licencia.

This all-stainless-steel railway car has nine individual compartments capable of seating six passengers each. It is 24.4 m long and weighs approximately 39 tons. The car, a main-line first-class type, was built for the French National Railways (SNCF) and exhibited at the French National Exposition recently held in Moscow. The manufacturers have built over 650 stainless cars under license from The Budd Co., USA. *Carel Fouche & Cie, France.* **IRJ 1**

## Portable Tachometer Senses Speeds

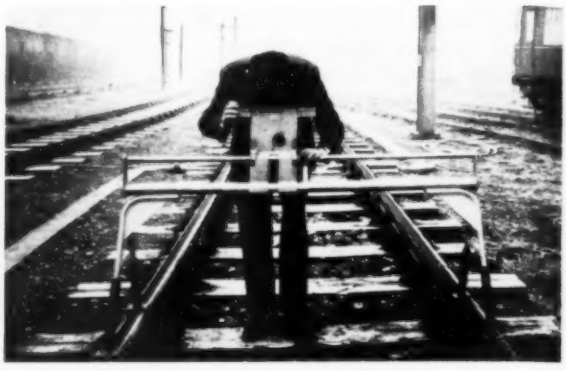
Vitesse du matériel roulant analysée, système portatif de tachomètre.
Tragbares Tachometer-Tastgerät misst Rollmaterialgeschwindigkeit.
Dispositivo portátil tacómetro analiza velocidades de material rodante.

The sensing devices of a portable tachometer are said to analyse rolling stock speeds by measuring a revolving white mark on a wheel. Other more obvious uses include the calibration of instruments and the adjustment of diesel engine governors. The M1148 and M1149 will operate from either a mains or external 12-volt battery supply and are robust in design. Rotation speeds are indicated on a circular scale. *Southern Instruments Ltd., England.* **IRJ 2**

## Light and Heavy Duty Couplers

Accouplements de manoeuvre, légers et lourds, de modèles simples.
Auffallend einfache Form für leichte und schwere Rangierkupplungen.
Acoplamientos de maniobra ligeros y pesados de diseño sencillo.

Scharfenburg's light-duty and heavy-duty shunting couplers feature simple design and fully-automatic coupling and uncoupling. A specially designed gathering pocket automatically aligns the coupler with a standard draw hook having a centerline 940 to 1090 mm above railhead. The 30-ton capacity 40-375(1) can be equipped with either mechanical or pneumatic coupling and has a maximum lateral play of 10°. *Scharfenbergkupplung GmbH, W. Germany.* **IRJ 3**



## Height and Stagger Gauge

Dispositif servant à déterminer la position de lignes aériennes.
Entfernungsmesser zur Bestimmung der Lage von Freileitungen.
Dispositivo para medir la posición de la catenaria.

The Barr and Stroud Height and Stagger Gauge is a specialized rangefinder for measuring the position of overhead cables in relation to railway lines. Big advantage is that power need not be switched off while measurements are being made. This makes it suitable for maintenance and routine checking as well as for construction work. The design is such that instruments can be made for any wire height or track width. *Barr & Stroud Ltd., Scotland.* **IRJ 4**

## New Aluminum Solder Has Many Uses

L'Aluminium à souder, nombreuses possibilités d'applications.
Lötaluminium wird bei der Eisenbahn vielfach verwendet.
Soldadura de aluminio tiene muchas posibilidades de aplicación.

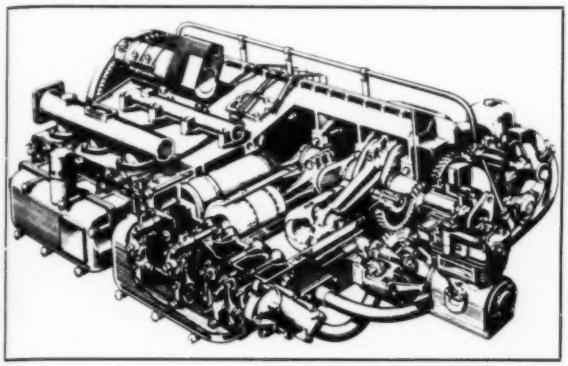
"Tin-a-Lum," a new solder developed for use on most types of aluminum and zinc based die castings, has such possible applications in the railway field as repair of aluminum engine parts, and of aluminum car door and window frames. The new solder is said to be easy to apply under almost any circumstances; to have good machinability; and to be highly resistant to corrosion once it is in place. *Metals for Industry, Inc., New Jersey, USA.* **IRJ 5**

## Suffolk Adds to Welding Products Line

Fonderie Suffolk annonce nouveaux produits de soudage.
Eisengiesserei Suffolk bringt neue Schweissmittel.
La Suffolk Iron Foundry anuncia nuevos productos para soldadura.

Latest additions to the Suffolk Iron Foundry's wide range of welding products include Silver Solder No. 38, in the copper welding and brazing alloy group; and Sifcut No. 40, a composite rod of tungsten carbide particles in a nickel Sifbronze matrix, in the cast iron and hard surfacing alloys section. The same company also has introduced a combined packaged cutting and welding outfit and two new cutting machines. *Suffolk Iron Foundry, Ltd., England.* **IRJ 6**

# from Railway Suppliers



## BUT 15 Liter Diesel Engine

Moteur diesel de construction rigide et compacte.
Dieselmotor starrer und kompakter Bauart.
Locomotora diesel, construcción rígida y diseño compacto.

Series 902 diesel engine is horizontally disposed for underfloor mounting and develops a maximum output of 230 hp at 1900 rpm. Rigidness of construction and compactness of design are two of the noteworthy features of this 15,174 cc 15.2 liter power unit. The cylinder block and crankcase are cast integrally. The engine is water-cooled, circulation being maintained by a gear-driven centrifugal pump. *British United Traction Ltd., England.* **IRJ 7**

## Gelled Primers Protect Steelwork

Nouvelle peinture de fond anti-rouille pour acier.
Neuer Schutzanstrich gegen Korrosion.
Nuevas imprimaciones protegen el acero contra la corrosión.

A new painting system can, according to its manufacturer, effect substantial savings in the time and labor costs of protecting structural steelwork from corrosion. The new system utilizes thick film gelled primers, two coats of which are said to be equal to four or five coats of conventional paint. Because the primers—originally developed for marine use—can be applied wet on wet, they are especially useful where painting time is limited. *John S. Craig & Co., Scotland.* **IRJ 8**

## Heavy Duty Ballast Regulator

Régulateur de ballast lourd disponible avec charrue reversible.
Schwerer Schottergleichschieber für zwei Richtungen ist im Handel.
Máquina pesada para el balasto con arado reversible.

The model 4FW-A Heavy Duty Ballast Regulator is available equipped with a new heavy-duty, reversible V-type plow. The plow is designed to move ballast in or out or to transfer ballast across the track in either direction. In addition the machine is equipped with heavy duty, reversible ballast regulating and scarifying wings. Hydraulic vertical control of the wings is available as optional equipment. *Kershaw Manufacturing Co., Alabama, USA.* **IRJ 9**

## Transistorized Microwave Carrier

Courants porteurs transistorisés à ondes courtes peu encombrant.
Transistor-Mikrowellen-Träger-System belegt Minimum an Raum.
Sistema transistorizado de corriente portadora microonda, muy compacto.

A completely transistorized microwave carrier system, the MX-106, requires only one fifth the space—and consumes only one eighth the power—of similar tube equipment. The system handles up to 600 voice channels. Standby features of the system include 100% backup of any equipment common to twelve or more channels. Illustration shows the card cage containing twelve channels. *Microwave Sales, Collins Radio Co., Texas, USA.* **IRJ 10**

## Railroad Wrecking Crane

Grue auxiliaire de chemin de fer pour l'Arctique.
Für den Polardienst gebauter Eisenbahnhilfskran.
Grúa ferroviario de socorro para servicio en regiones árticas.

Ursa Minor railroad wrecking crane, of 13,607 kg lifting capacity, is of diesel hydraulic design, mounted on a six-axle, double-bogie carriage. Designed for arduous railroad wrecking service under Arctic conditions, the crane will pass a rolling-structure gauge 4.72 m high × 3.3 m wide and will negotiate curves of 38° or 45.72 m minimum radius. The maximum axle-load, with jib suspended and blocks supported, is 22,675 kg. *Cowans Sheldon & Co. Ltd., England.* **IRJ 11**

## 'Uni-Cretor' Can Handle Four Major Jobs

L'Airplace "Uni-Cretor" effectue quatre tâches différentes.
Airplacos "Uni-Cretor" für vier verschiedene Arbeiten.
Airplaco "Uni-Cretor" se puede emplear para cuatro tareas diferentes.

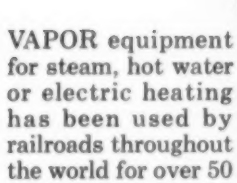
A new all-purpose concrete placing machine is said to be capable of performing four different types of jobs—wet gunning, concrete placing, hoisting and placing mortar and grout, and high and low pressure grouting. Compact in design, and weighing only 1000 kg, the machine is powered with a 56-hp air-cooled engine and has a transmission with three-speeds forward and reverse. *Air Placement Equipment Co., Missouri, USA.* **IRJ 12**

# VAPOR PRODUCTS

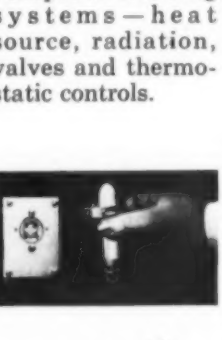
## serving railroads for over 50 years

VAPOR equipment for steam, hot water or electric heating has been used by railroads throughout the world for over 50 years. Vapor makes complete heating systems—heat source, radiation, valves and thermostatic controls.

The VAPOR model OK steam generator is light, robust, reliable and compact. Statistics of OK-4616: sustained output—750 kg/h; weight—1,350 kg; overall dimensions—165 x 110 x 160 cm. Similar models available with outputs ranging from 225 to 2,000 kg/h.

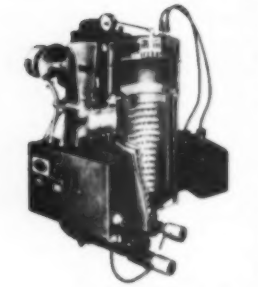


The VAPOR Thermostat shown here is one of the models designed for railroad heating and air conditioning systems. VAPOR Thermostats manufactured to rigorous standards flatten the curve of temperature variation to within one degree centigrade.



EQUIPMENT MADE IN HOLLAND

Also illustrated is the compact VAPOR W-120 Circulating Water Heater (approx. 115 kg and 70 x 40 x 48 cm, with 32,000 kg Cal/h output) for heating diesel railcars and locomotives. Automatically maintains temperature of engine coolant to assure full operating efficiency.



*Also available for lower heat output requirement the B-70 heater with a capacity of 16,000 kg. Cal.*

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or

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## PEOPLE
### in the news

CANADIAN NATIONAL RAILWAYS—**Mr. Gerard M. Coleman,** 41, has been appointed manager of sales for Canadian National Hotels, it has been announced by **Mr. S. S. Chambers,** general manager.

CANADIAN PACIFIC RAILWAYS—**Mr. W. J. Furlong,** foreign freight traffic manager, has retired. He is succeeded by **Mr. J. N. McPherson,** general foreign freight agent.

GENERAL ELECTRIC CO. (US)—**Charles J. Ellis** and **Harry P. Gough** have been elected regional vice presidents for the Southeastern and Western regions respectively. Mr. Ellis succeeds **Carter L. Redd** who, until his retirement from the company on 1 January 1962, will be consultant to Mr. Ellis. Mr. Gough succeeds **Clarence C. Walker,** who retired from the company on 1 November 1961.

INDIAN RAILWAYS—**Dr. S. S. L. Verma,** divisional medical officer, Varanasi, North Eastern Railway of India, has been appointed chief medical officer, Eastern Railway.

RHODESIA RAILWAYS—At the request of the United Kingdom Government, **Mr. L. A. W. Hawkins,** assistant general manager (Operations), has been released on secondment to the Swaziland Railway Authority for a period of five years. Mr. Hawkins will be chairman of the Swaziland Railway Board and chief executive officer of the authority.

**Mr. A. H. Croxton,** principal executive officer (Special duties) has been appointed temporarily as assistant general manager (Operations) pending the integration of the Operations division with one of the other divisions.

SOUTH AFRICAN RAILWAYS—**Mr. L. D. Vos,** superintendent (Commercial), system manager's office, Pretoria, has been promoted to superintendent (Commercial), system manager's office, Cape Town.

**Mr. P. J. Strydom,** chief clerk (Operating), system manager's office, Kimberley, has been promoted to assistant superintendent (Operating), system manager's office, Kimberley.

VICTORIAN RAILWAYS—**Mr. R. S. Miller,** 55, one-time acting-chief civil engineer of the Victorian Railways, has been appointed chief engineer of the railway construction branch of the board of land and works. He has succeeded **Mr. T. H. Jenkins,** who retired on 24 August 1961.

# WORLD REPORT CONTINUED

**MAURETANIA:** Société des Mines de Fer de Mauritanie, which is engaged in laying a rail line of over 600 km from the port of Port-Étienne to the iron ore deposits of Fort-Gouraud in the western Sahara, has announced the completion of the first 107 km of line from Port-Étienne to the Boulanouar oasis. Ten locomotives and 168 cars are already in service on the line.

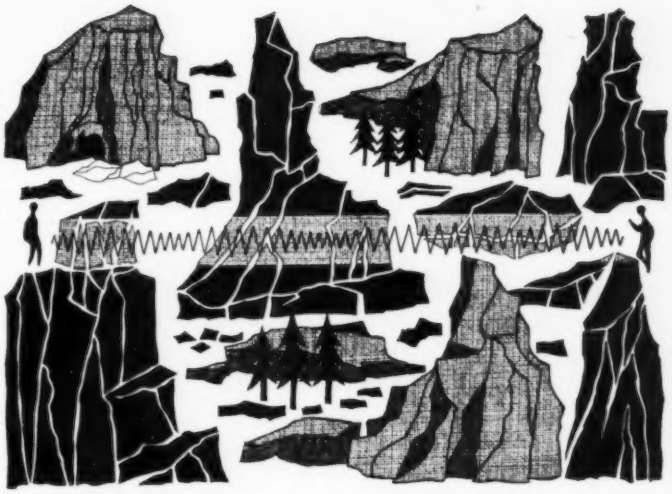
**NYASALAND:** Nyasaland Railways Ltd. reports a net operating surplus of £110,381 for 1960, a decline of 9.6% below 1959. Increased operating expenses resulting from wage increases and labor difficulties are responsible for the decline.

**POLAND:** Tests are to begin next year of the Polish 104 A passenger car, said to be the first of its kind in Europe. With a length of 24.5 meters, the car will contain four first-class and five second-class compartments—each of which will be 30 cm longer than present cars. Serial production of the 104 A is planned for 1963.

. . . The Pafawag railway works in Breslau, a city in East Germany under Polish administration, has announced the beginning of construction of three-car electric trainsets with a capacity of 192 and a speed of 110 km/h.

**SOUTH AFRICA:** A 50-km branch line will be constructed to serve the Phosphate Development Corp. operating in north eastern Transvaal. The construction of the line at a cost of more than £2,000,000 is the result of an agreement between the corporation and the South African Railways. The line is to be built to a standard of not less than 27-kg rail by the SAR.

**SWAZILAND:** The British government and the Anglo-American Corp., a large mining and industrial concern which will develop vast iron ore deposits in the territory, have announced a £9,000,000 railway construction project for the Swaziland Protectorate. The iron ore deposits, estimated at 47,000,000 tons, are located at Bomvu Ridge near the capital town of Mbabane. Two Japanese steel firms have contracted to buy 12,000,000 tons of this ore. According to present plans, a 1.067-m gauge railway will be built to transport it 100 miles to the Mozambique Railway railhead at Goba from where it will be carried over the CFM system to the port of Lourenco Marques. The line will traverse the northern part of Swaziland and it is expected that it will be laid with 36-kg rail. For the first 80 km from Bomvu Ridge, it will traverse mountainous country and the ruling grade will be 1 in 50. In addition to transporting 12,000,000 tons of ore over the first 10-year period, the line will carry wood pulp, sugar and fruit to the coast.

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**USSR:** The Soviet Union has announced that electrification of the 5300-km section of the Trans-Siberian railway from Moscow to Irkutsk, near Lake Baikal, has now been completed. According to Moscow, electrification of the final stretch—a 273-km section between IsylKul and Makushino—was completed in recent weeks. Under previously announced plans, the USSR expects to electrify 40,200 km of line by 1970, and to convert almost its entire rail network to diesel or electric traction in 15 years. According to *Pravda*, the Soviet Union has electrified 9000 km of line in the last five years, and electrified lines now handle 25% of all rail freight traffic in the USSR. Most electrification thus far has utilized a DC system, but Russia is turning increasingly to AC and, reportedly now has some 1500 km of line powered by a new AC system. According to *Pravda*, electrification of lines from Donbas to Sochi and Tbilisi will be completed next year. During the course of the current Seven-Year Plan, Russia plans to electrify the entire Oktyabraskaya line.

# WORLD POLL CONTINUED

## SOUTH AFRICAN RAILWAYS

Total: 139,000,000 rand*

| | |
|---|---|
| Locomotives | 1,507,000 rand |
| Passenger cars | 13,802,000 rand |
| Freight cars | 17,954,000 rand |
| New line construction | 5,000,000 rand |
| Major track improvements | 41,146,000 rand |
| Electrification | 5,414,000 rand |
| Signaling | 1,734,000 rand |
| Communications | 1,210,000 rand |
| Shop and repair facilities | 8,711,000 rand |
| Bridges and buildings | 25,537,000 rand |
| Other expenditures | 16,985,000 rand |

* 100 rand = $ 140 US.

## SUDAN RAILWAYS

Total: £S 7,022,000*

| | |
|---|---|
| Locomotives | £S 3,320,000 |
| Passenger cars | £S 40,000 |
| Freight cars | £S 110,000 |
| New line construction | £S 984,000 |
| Major track improvements | £S 1,531,000 |
| Signaling | £S 10,000 |
| Communications | £S 10,000 |
| Shop and repair facilities | £S 211,000 |
| Bridges and buildings | £S 361,000 |
| Other expenditures | £S 445,000 |

* £S 100 = $ 280 US.

## TAIWAN RAILWAY

Total: TW$ 156,902,700.00*

| | |
|---|---|
| Passenger cars | TW$ 34,394,000.00 |
| Freight cars | TW$ 25,526,000.00 |
| Major track improvements | TW$ 25,559,200.00 |
| Signaling | TW$ 17,900,000.00 |
| Yards and terminals | TW$ 10,504,900 00 |
| Shop and repair facilities | TW$ 5,630,500.00 |
| Bridges and buildings | TW$ 28,215,600.00 |
| Other expenditures | TW$ 9,172,500.00 |

* TW$ 100 = $ 2.5 US.

## TASMANIAN RAILWAYS

Total: £A 336,735*

| | |
|---|---|
| Locomotives | £ 47,888 |
| Passenger cars | £ 24,000 |
| Freight cars | £ 34,515 |
| Major track improvements | £ 29,900 |
| Signaling | £ 1,600 |
| Communications | £ 1,700 |
| Yards and terminals | £ 39,732 |
| Shop and repair facilities | £ 10,669 |
| Bridges and buildings | £ 96,736 |
| Other expenditures | £ 49,995 |

* £A 100 = $ 225 US.

## UNION OF BURMA RAILWAYS

Total: 66,627,000 Kyats*

| | |
|---|---|
| Locomotives | 14,251,000 Kyats |
| Passenger cars | 11,485,000 Kyats |
| Freight cars | 3,047,000 Kyats |
| Major track improvements | 13,698,000 Kyats |
| Signaling | 3,150,000 Kyats |
| Yards and terminals | 3,775,000 Kyats |
| Shop and repair facilities | 821,000 Kyats |
| Bridges and buildings | 15,423,000 Kyats |
| Other expenditures | 977,000 Kyats |

* 100 Kyats = $ 21 US.

## VENEZUELAN STATE RAILWAYS

Total: 57,422,631 Bolivar*

| | |
|---|---|
| Locomotives | 3,250,000 Bolivar |
| Passenger cars | 273,000 Bolivar |
| Freight cars | 2,609,360 Bolivar |
| New line construction | 44,166,324 Bolivar |
| Signaling | 819,700 Bolivar |
| Communications | 48,750 Bolivar |
| Yards and terminals | 583,155 Bolivar |
| Bridges | 739,402 Bolivar |
| Other expenditures | 4,832,940 Bolivar |

* 100 Bolivar = $ 21 US.

## VICTORIAN RAILWAYS

Total: £A 8,200,000*

| | |
|---|---|
| Locomotives | £ 140,000 |
| Passenger cars | £ 1,720,000 |
| Freight cars | £ 1,000,000 |
| New line construction | £ 40,000 |
| Major track improvements | £ 870,000 |
| Electrification | £ 160,000 |
| Signaling | £ 70,000 |
| Communications | £ 30,000 |
| Yards and terminals | £ 1,550,000 |
| Shop and repair facilities | £ 1,140,000 |
| Bridges and buildings | £ 470,000 |
| Other expenditures | £ 1,010,000 |

* £A 100 = $ 225 US.

## VIETNAM RAILWAY SYSTEM

Total: VN 6,395,880,000 Piastres*

| | |
|---|---|
| Locomotives | 2,940,000,000 VN |
| Passenger cars / Freight cars | 3,307,000,000 VN |
| New line construction | 30,000,000 VN |
| Major track improvements | 14,000,000 VN |
| Signaling | 480,000 VN |
| Communications | 5,000,000 VN |
| Shop and repair facilities | 77,500,000 VN |
| Bridges and buildings | 7,200,000 VN |
| Other expenditures | 14,700,000 VN |

* VN 100 Piastres = $ 1.36 US.

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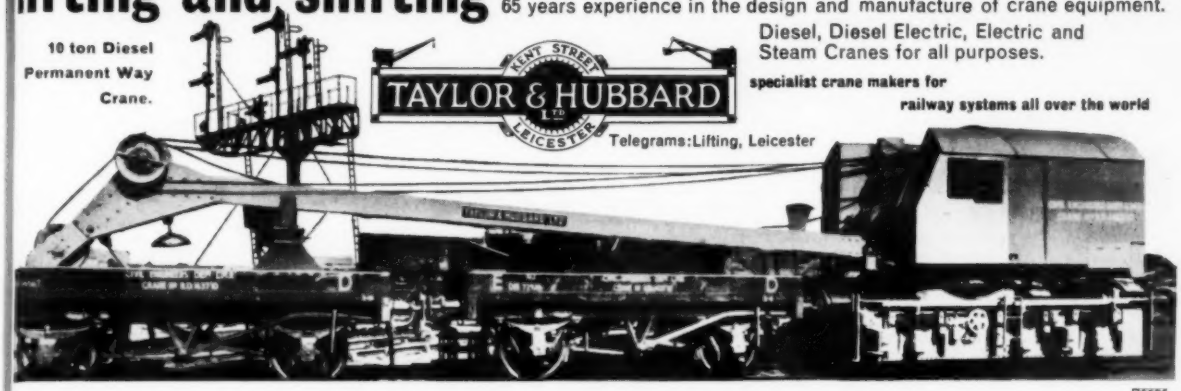

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## Railway Bookshelf

**Le Matériel Moteur SNCF,** by Jacques Defrance (Editions Sefna, Paris; 320 pp)—Detailed information on all French locomotives in service during 1957, with additional figures on equipment used up to 1959. Now that steam is disappearing from the SNCF, the writer's aim—to give a comprehensive view of French traction—is not only of interest to the motive power expert but also the railway enthusiast. Contents include details of steam locomotives and tenders, electric locomotives, diesel locomotives, diesel shunters, electric trainsets and diesel trainsets. (French)

**De navolging van de Amerikaanse vervoerspolitiek en van de Interstate Commerce Commission in de Europese Gemeenschappen,** by Dr. Tissot van Patot en Mr. Rueb (Stichting Verkeerswetenschappelijk Centrum, Rotterdam; 250 pp)—This study is an answer to a problem: the shaping of a common transport policy in the six countries of the European Common Market. The authors have investigated practices in the US and made a thorough examination of the possible solution of following American policy, including the creation of an Interstate Commerce Commission in Europe. For various reasons such a course is not recommended. Positive suggestions are put forward concerning qualifications of a European Common Market Transport Çommission. The information given in this study includes a description of the US and European transport patterns. (Dutch, French and German)


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## After Hours with Jim Lyne

**PUBLIC VS. PRIVATE OWNERSHIP**—Officers of railways owned by government sometimes speak enviously of managements of commercially controlled railways—imputing to them the ability to avoid some of the wasteful practices that (they believe) inhere in ownership by government. Multiple railways under commercial management have their peculiar troubles, though. For example, each railway, to protect its traffic volume, has to make rates which will enable producers on its line to compete successfully with producers on other railways who may be much closer to consuming markets. With severe highway competition, railways close to markets may have to reduce their rates considerably—which means that the railways with producers a long distance from markets may have to make really ruinous reductions. Where there is only one railway, it does not have to face this dilemma. If the long-haul traffic vanishes, the railway still may hope to move the same tonnage of the commodity in question, even if for a shorter distance.

**LONG-RANGE BUDGETS**—An officer of a government railway recently pointed out to one of my colleagues another advantage (from the standpoint of management) which he perceived in government ownership. This advantage, he said, lies in the ability to plan a long-range program of improvements—and to adhere to it, despite the ups and downs of current annual earnings. Such steadiness in improvement programs is an advantage all right—no doubt of that. But it is an advantage which private companies also enjoy to an equal degree—provided political interference does not deny to them an opportunity to achieve generous earnings.

**"URBAN RENEWAL"**—There is quite a lively discussion going on in the USA about what is called "urban renewal"—tearing down old buildings in urban centers and replacing them with modern structures, and improving transportation.

Unfortunately, too much of the urban development which is accepted as improvement has been just the opposite—too much reliance on highway transportation, for example. Urban planners are beginning to recognize that the private automobile is not suited to central-city transportation. It occupies too much space. As one authority (Lews Mumford, in his recent book "The City in History") has observed:

"By favoring the truck over the railroad for long-distance traffic, we have replaced a safe and efficient service by a more dangerous and inefficient one. If we want to improve our highway system, we should be zealous to keep as large a part of goods haulage as possible on the rails."

Diesel Hydraulic Bus, Egyptian Railways

1,560 BHP Diesel Electric Locomotive, Taiwan Railway Administration

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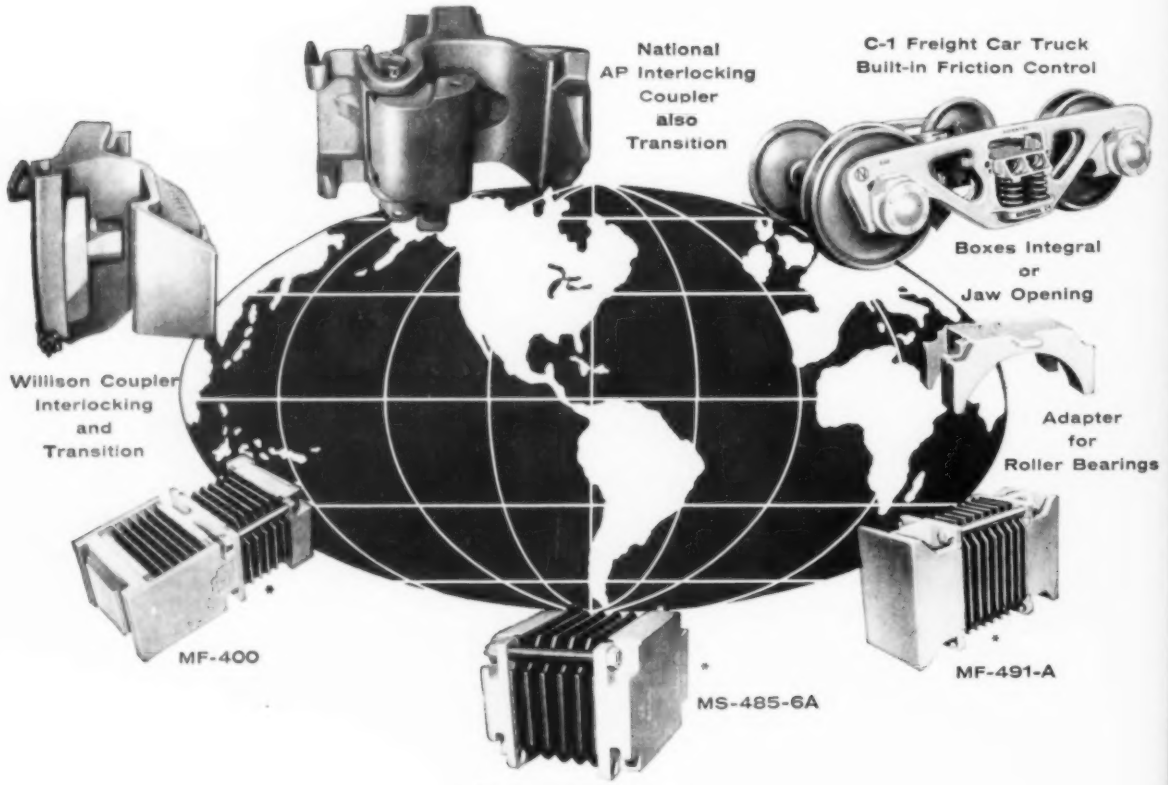


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